

THE BRAINS TRUST BOOK

Edited by
HOWARD THOMAS

THE BRAINS TRUST BOOK

(Published by courtesy of the B.B.C.)

Edited by HOWARD THOMAS

Introduction by DONALD McCULLOUGH

Answers to "Any Questions?" by
Commander A. B. CAMPBELL, Dr. JULIAN S. HUXLEY
Professor C. E. M. JOAD, and guests of
The Brains Trust

107th thousand

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THESE GUESTS . . .

JAMES AGATE.

HAROLD LASKI.

E. N. DA C. ANDRADE.

DESMOND MACCARTHY.

TOM CLARKE.

KINGSLEY MARTIN.

CAPTAIN PETER FLEMING.

HAROLD NICOLSON.

MARGERY FRY.

QUENTIN REYNOLDS.

J. B. S. HALDANE.

MALCOLM SARGENT.

GROUP CAPTAIN HELMORE.

F. G. THOMAS.

LESLIE HOWARD.

ELLEN WILKINSON.

EDWARD HULTON.

DOUGLAS WOODRUFF.

*. . . were responsible for some of the answers
in this book.*

ACKNOWLEDGMENTS

"The Brains Trust" was an idea that only radio and only the B.B.C. could have launched and developed into a national institution within such a short space of time. Here the resident members of "The Brains Trust" would like me to thank the Corporation for its patience and its vision and, often, its courage. Thanks are due, in particular, to the Controller of Programmes, Mr. B. E. Nicolls, for his personal interest and for his steering of "Any Questions?" through the troubled waters of policy and public reaction. In turn, I would like to thank Dr. Huxley, Commander Campbell and Professor Joad for gambling their literary reputations on my editorship, and allowing me a free hand in the choice of questions and in the sub-editing of their answers. There is a wide gulf between English written at leisure and English spoken in discussion under nerve-racking conditions, but in spite of this many of the answers are brilliant enough to survive their transition from heated moments to cold print. Prepared answers from Huxley and Joad would have been very different, both in style and in content, but it is the spontaneity and sparkle, the clash of wits on unexpected topics, which have attracted a mass audience for what was planned as a minority programme. The resident members of the Brains Trust and the guest experts have all very bravely consented to their answers appearing in this publication, and everyone has agreed that the royalties shall buy books for the men in the Forces.

My choice of questions will not satisfy everyone, and you may find your favourite answer missing; but please remember that there was space for only sixty questions out of four hundred answered by the Brains Trust, and 80,000 sent in by listeners.

How much of this conglomeration of fact and opinion will listeners have absorbed? Very little; but the B.B.C. never intended to deliver a radio encyclopædia by weekly instalments. What "Any Questions?" has tried to do is to give listeners something worth thinking about; to introduce them to new subjects and a broader conception of living; to be a "trailer" of knowledge.

H. T

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THIS IS THE BRAINS TRUST

THE Brains Trust was founded in London on a cold and wet Thursday in January, 1941. London had been taking it. So had the B.B.C.

Buildings had been bombed. Most people had been working under intense strain and felt sleepy. Chips of glass lay in the streets.

The authorities were facing the problem of trying to stimulate the minds of hundreds of thousands of men in the Forces who had been swept from their homes to guard their country. Dumped in outlandish spots, they were almost completely cut off from contact with intellectual pursuits. It was thought that the number of men in the Forces interested in the pursuit of knowledge might be small. But they formed a valuable minority and the B.B.C. had undertaken to help by getting an experimental team of professors to answer any questions the troops might care to ask. I was supposed to put the questions, prevent brawls and generally deflect gloom or despondency.

It did not sound exciting and as I stumbled into a dark and rather stuffy underground studio, I felt sorry for the troops who were supposed to listen. I also felt fairly sorry for myself.

Only one other man had turned up. I know now that Commander Campbell has a heart of gold. But the first time you see him he looks extremely fierce. The next arrival was a small man with a grey beard and bright eyes. He clumped in wearing large boots with loud nails. He had on a rustic tweed suit and carried a vast haversack. I had never seen him before and the more I looked at his boots

the more gloomy I felt. If anyone had suggested then that millions of people were going to listen in rapt amazement to his whirlwind expositions of the most complex philosophical problems, you could have knocked us both down with a blunt instrument. That was Joad. In due course, Julian Huxley, looking extremely harrowed, arrived with Howard Thomas. Thomas had to organise the programme from an office 120 miles away in Bristol. He was, at the same time, trying to get his family out of a vulnerable area. Julian Huxley was directing the A.R.P. arrangements for the London Zoo, and had recently rounded up a stallion zebra that was naturally making for Camden Town, so they were entitled to look a little distraught. They both had complex stories about the cause of their delay, stories to which, I need hardly say, we listened with very little interest.

We then all settled down in a draughty corridor to talk about procedure, and having worked out a very rough scheme, we went even farther underground to a studio. There we found a large dance band and a couple of crooners about to let fly. We knew that by some curious ruling the Brains Trust was being floated by the Variety Department of the B.B.C., but I must confess that the idea of being accompanied by a band had not occurred to us. As it turned out the idea had not occurred to anybody. The band had merely been sent from some other studio that had been put out of action. They were quite sympathetic, but pointed out that it would be easier for us to get a few professors moved along than for them to shift their drums and xylophones, so we meekly started off in search of another studio.

I tell the story because it is typical of what the B.B.C. had to face all through that winter—problems that would have completely defeated a less courageous and ingenious team. Everybody now knows that B.B.C. buildings have

been hit time after time and that members of the staff have been killed and hurt. But the programmes have always carried on. That is by the way.

In due course the virginal Brains Trust settled down in another underground retreat, very late, rather cold and by now fairly irritable. We huddled round a microphone with seven questions. The lights popped in and out, and off we went. One of the first questions was: "What are the Seven Wonders of the World?" No one knew, and by this time I don't think anyone very much cared. We struggled on in a series of furious silences, punctuated by periods when everyone would begin to talk at once, creating a tidal wave of wisdom that swamped the microphone and paralysed the engineers. We knew it was the first broadcast of its kind and we felt certain it would be the last. We reckoned the troops would agree that the war was bad enough without having to listen to this kind of thing. In any case, we assumed that "Any Questions?" would soon die of starvation because there wouldn't be any.

We were quite wrong. Even after the first effort we got 15 questions and we thought that was grand. The following week we got 30. Within a month we were getting 30 a day. We began to get things arranged better and the questions shot up to 100 a day. At the present time we get well over 2,000 questions a week. In view of the present cost of postage, this is really staggering. The Brains Trust was originally planned to bore the Forces mildly from 5.30 to 6 on Wednesday afternoons. In response to floods of letters, it was transferred to 5.30 on Sunday—an important and popular time. Then it was increased to three-quarters of an hour and recorded programmes were sent out on the Home wavelength a few days later. To-day something like 10,000,000 people don't switch off for the Brains Trust.

That is the story of a new experiment in the sharing of

knowledge, and this book is the result of requests from many listeners who want to see it in writing.

It may not read as well as it sounded. But it sounded remarkably impressive, and it must be remembered that it was produced without warning and without preparation in an atmosphere exquisitely unsuited to the peaceful contemplation of the good life.

Anyway, that is how the Brains Trust began and here are the questions.

DONALD H. McCULLOUGH.

SECTION I

"ANY QUESTIONS?"

Answers by the Brains Trust to some questions sent in by listeners.

THE MISSING LINK

Mrs. Muriel Kemball, of Torquay, asks: "What exactly is the missing link in the chain of evolution?"

Julian S. The term "missing link" was used, once
Huxley: the theory of Evolution had been accepted, for the hypothetical organism which would bridge the gap between human and pre-human man and his ape-like ancestral form. To-day all that gap has been largely bridged. The nearest to what people meant by "the missing link" is the famous Pithecanthropus, which is just about half-way between an ape and a man in its bodily form, shape of skull and size of brain. Perhaps it is a little on the ape side. Then there is Pekin man, and some others found recently which are definitely on the human side, and others which, though definitely apes, are more human than any species of ape alive to-day. The link is no longer missing.

I want to ask Huxley a question. Is the
C. E. M. Joad: evidence sufficient to enable one definitely to turn down what is called the Doctrine of Fixed Types—that is to say, that there are certain real clefts that go between the human species and its nearest animal relation? If that were true, of course, there would be no missing link, because there would be no bridge across the cleft. Do we know enough definitely to turn that down?

Julian S. No, the doctrine of Fixed Types is as
Huxley: dead as mutton—killed by the facts. With regard to man and apes, the resemblances are extraordinarily close, apart from brain size, and even in that particular character the gap has been bridged. On that point the most interesting thing is that the essential anatomical difference between the human

and the ape brain is almost entirely a quantitative one—a difference in the size of the areas of the brain which have to do with association of ideas.

HOW TO CONCENTRATE

Miss Vera East, of Croydon, wants the Brains Trust to define concentration. How can the ordinary person learn the art of concentration ?

C. E. M. Joad: Concentration means at least two different things. The normal meaning among us is related to focussing the whole power of your mind upon a given subject at a given time. The answer to how you do it is simply training and discipline. But if you, as it were, take lessons, you can increase your power of focussing all your talents and all your abilities at one place, at one time. The important thing is what one calls integration. Normally one is a person who gets emotions, who has thoughts, who has desires, who has hopes. One is being pulled lots of different ways. In extreme cases, one is a number of different persons. So what one has to do in order to concentrate is to bring all those different persons into one, submerge them all in a single embracing personality, and then focus the whole of that personality upon the point of discussion. Concentration means two things, because there is also concentration which, in the East, means something entirely different. It is a power of making contact with what the people in the East call reality. That's a bigger business and a much more important one.

SEA TIME

A policeman's wife wants to know how sailors tell the time on ships by bells and watches. We're all looking at Commander Campbell. He's coming out of his corner, and looking extremely confident.

Commander A. B. Campbell: In the early days, both ashore and afloat, the hour-glass was used. It was half-an-hour top and half-an-hour bottom glass, and at sea it was a boy's job to sit aft under the ship's bell and watch the hour-glass. When one half-hour had gone, he would strike "one" on the ship's bell, and then turn

the glass over. When the hour had gone—two bells, then he'd turn it and run along forward and say, "One hour of the watch has gone, and by the Grace of God more may follow." The pious members of the crew would all say, "Yes, we hope so." That went on, you see, and it was discovered that the reasonable time for a man to keep a watch was four hours. So you see that means striking eight bells for the four hours. Now with the watches, the first ship's watch is from eight to twelve—that's called the first watch in the evening. And the middle watch is from twelve to four, the morning watch is from four to eight. Then the next watch runs from eight to twelve in the forenoon, and the afternoon watch is from twelve to four. Then comes a slight variation. The four to eight watch is divided into two short ones which are called the "dog-watches." They are two watches of two hours each. And here the bells differ just a little, because five bells is never struck in the second dog-watch. The bell goes one, one-two, one-two-three, one-two, three-four, then back to one bell, and then on again to eight bells at eight o'clock. The reason for this is that, at the Mutiny in the *Nore*, the signal for the rising was five bells in the second dog-watch. From that time the Admiralty have never struck five bells in that watch. I hope I have made it quite clear.

Donald McCullough: Well, there's quite an outburst of applause from the Brains Trust itself here, and I congratulate the gallant Commander on a first-class reply.

C. E. M. Joad: What is known as laying out a question.

"BUMP-READING" DISMISSED

A Lancashire listener wants to know if the claims of phrenologists are based on scientific facts. Are there, in fact, bankers' bumps, butchers' bumps, and so on?

Julian S. Huxley: No. The phrenologists' claims are not based on scientific facts. Even if there were to be found a correlation between the size of a part of the brain and some faculty, which is most unlikely, some particular faculty, such as the phrenologists thought they could deduce, like philoprogenitiveness and acquisitiveness and so on, the variations in the thickness of the skull would more or less wipe that out altogether. There is some localisation of function (as the

physiologists call it) in the brain, and there are parts of the brain which are specially important in speech and sight and so forth, but recent work has made it clear that the higher part of the brain acts as a whole, and that you have it acting as a whole with these different parts playing something of a preponderant rôle in it.

I'd like to go beyond Huxley. Not
C. E. M. Joad: because I disagree with him, but because I'd like to expose what seems to me the kind of fallacy which underlies the question and on which phrenology is based. The fallacy is really that you think with or that your personality is bound up in your brain. Now if that were so, you would expect that the nature, the size, the contours of a person's brain would vary with the kind of person he is. And then perhaps the nature, the bumps, the contours of a person's skull would vary with the kind of brain that he has. But I think (and obviously there is a lot to be said for this view) that one's personality and one's mind is not a material but an immaterial thing. If so, it doesn't occupy space. If so, no information about the kind of brain you've got really can tell you anything about the kind of person you are, or, to come to the question, about the kind of profession you follow. Therefore, the kind of person you are, the kind of profession you follow, has no bearing upon the nature of your skull. It doesn't surprise me to hear from Huxley that there is very little success in correlating what we call mental functions and personal characteristics with areas in the brain. Just what I should expect, the mind isn't the brain, and it isn't *in* the brain.

THE COMMANDER'S SEA SERPENT

Mrs. Slade, of Watford, whose husband is in the R.A.F., asks: "Will the Brains Trust accept the evidence for sea monsters?"

Commander A. B. Campbell: I think, without doubt, there are such things as sea monsters. I've not only seen certain of them—I've smelt 'em. Oh, yes I have, honestly.

Julian S.

Huxley: What do they smell like?

Commander Well, we were lying in a very secluded bay, north of the American coast, and taking a stand-easy on deck, when suddenly a terrible smell pervaded the ship. I thought something had gone wrong. I got up, and there about 70 yards away were three big lumps in the water, moving, and we counted along from one stanchion to another, 70 feet of this creature. It stank most horribly. It came near to the ship, and then took a dive. The following day, two of them turned up, and we could see 70 feet of them, and they certainly were some sort of sea monster. Unfortunately we got no snaps of the head, but we got a photograph of the bumps; they weren't very plain, but it was some huge creature without doubt.

Julian S. There are some very remarkable deep-sea animals which occasionally come up to the top of the sea, quite apart from whales, which have to come up regularly to breathe. One of the origins of the story of the sea serpent is undoubtedly the ribbon fish which may grow twenty-five feet at least in length, probably much more, and is serpent-like in a long, ribbony form. The fin-rays, on its head are erected into a long red crest, so that it looks as if it had a hairy crest on it. Then there are the porpoise stories. There are, of course, the giant squids and so on, which must sometimes come to the surface. There are also some very curious, admittedly curious, stories, which seem to be well attested, of things with a serpent-like nature. But it is very odd that the remains have never been thrown up on shore. Whenever they have been they have always turned out to be something which we knew of before. In the philosophical transactions of the Royal Society, there is a long account of a sea serpent which was grounded in this country, and which is actually the skeleton of a basking shark with its jaws having dropped off, and slightly disintegrated in other ways. The man re-created it in the wrong way and turned it into a thing with four legs.

JOAD IN A HAUNTED HOUSE

A Naval Officer wants to know if the Brains Trust believes that houses and people can be haunted.

C. E. M. Joad: I think so. Quite definitely. I have had a certain amount of experiences in connection with a body called the University

of London Council for Psychical Investigation, and I have seen an immense number of things, with regard to which, perhaps, I had better make the non-committal answer, "I don't understand what their causation is." The fact that I don't understand is not important, because I am simple and anybody can deceive me. When I used to go to Maskeleyne and Devant's, as a boy, I not only didn't know how the tricks were done, which I think was common, but I didn't even think I knew how they were done, which was most uncommon. When, therefore, I have seen such things as a handkerchief lift itself from a table, tie itself into a knot in the air, without knowing how it was done, that has not meant very much. But when I have noticed that sitting at the same séance table there have been two members of the Magic Circle, who, on the principle of "Set a thief to catch a thief," ought to have known, and they haven't known, I have really felt "Now here is an event whose causation we don't understand."

Again, when in a séance room you notice that although five or six people have been sitting for two or three hours in a closed room, the temperature goes down instead of going up, and is recorded as having gone down by a sealed thermometer, and you notice further that the lowest point reached coincides with the maximum intensity of happenings, there again is something here which you simply cannot understand. In that sense I believe that all kinds of things take place in the realm known as psychical research whose causation escapes us.

As to ghosts, as to haunted houses, I have never seen one. But I have been to what I think is the most haunted house in England. That is a rectory in Suffolk. I would recommend anybody who is interested to read a book called *The Most Haunted House in England*, by Harry Price, which is a record of the most astonishing happenings going on for about three or four hundred years.

I myself have never actually seen a ghost in that house, although during the time when I was there a very mysterious phenomenon did occur, and that was the appearance on the white-washed walls of the house little pencilled squiggles, "doodles." Apparently they could not have been made by any human agency. Now the idea that ghosts not only materialise lead-pencils, in this case indelible lead-pencils, but also materialise fingers to use to write with the pencils, seems to me totally incredible. On the other hand, circumstances were such in which I could not possibly see

how the marks could have been caused. So, you see, I am in a position really of suspended judgment. Here are things in regard to which it is equally impossible for me either to believe that they happened, or to believe that they did not happen. Therefore, on general grounds, I think I am rather predisposed to what is commonly called "The ghost theory."

Commander I feel sure that the naval officer who
A. B. Campbell: put that question must have met some old salts who remember seeing not a ghostly house but the ghostly ship, the *Flying Dutchman*. I have seen the ship myself off the Cape.

C. E. M. Joad: Explanation, please !

Commander Well, there is a practical one. The
A. B. Campbell: suggestion is that in very bad weather suddenly a wind comes along and whips off the crest of a wave and throws it high in the air. Just at that moment the cloud leaves the moon open and shows this white mass of foam, and it does look like a ship.

C. E. M. Joad: Is that what you believe yourself ?

Commander No, no. I believe in the *Flying Dutch-*
A. B. Campbell: *man*, and I daresay our questioner there has met many old salts who have, too.

Julian S. I agree with Joad that there are a great
Huxley: many extremely circumstantial accounts which point to hauntings of some sort.

But I think it is fair to point out that there is also a great deal of evidence which shows that a number of hauntings and ghosts are due to hallucinations. He would agree with that, I take it.

C. E. M. Joad: Certainly, I agree, yes !

Julian S.
Huxley: The majority probably.

C. E. M. Joad: Yes, 99 per cent. I should think.

Donald Well the answer seems to be in the
McCullough: affirmative—but subject to hallucinations.

WHAT IS A POLTERGEIST ?

Part One

Mr. W. R. Livingstone, of the Home Guard, asks what is the scientific explanation of a poltergeist ?

C. E. M. Joad: A poltergeist is the kind of creature who inhabits a haunted house. What is it that is typical of haunted house phenomena ? Suddenly in a haunted house (it is probably an old one, but not always) lumps of coal and chunks of soap are thrown about, drawers are pulled open, basins of water are overturned, children's hair is pulled, pictures fall from the wall, bells ring, thunderous knockings are heard. I myself once got a black eye through being hit with a piece of soap in a haunted house. But how and why ? Well, there is no scientific explanation and most people—I think most people round this table—will deny that such things ever happen, and will insist that I am either telling a tall story or am the victim of a delusion. The traditional explanation is that the agencies responsible are elementals or earth spirits which are disturbed when people dig in the ground. I would like to offer a sort of explanation and it's this : I think that the human mind or soul may not be a simple thing ; I think it is maybe an extremely complex thing, a complex thing which comes into being as a result of a combination of two different things, namely, the body and some other principle which I will call the "psychic factor" which associates with the body to form a mind. Now at death the combination is broken up, and the mind, as such, goes, therefore, out of existence ; but the other principle, the "psychic factor" which associated with the body to form a mind, may survive for a time—notice that it is not itself a mind, though it is one essential element of the mind, a core, if you like to put it so, of raw mind-stuff—and may still retain its power of associating with pieces of matter, as it once associated with the body of the dead person, and animating them with vital activity. Hence the flying lumps of coal, chunks of soap, and so on.

Part Two

Several listeners want to know if Professor Joad was really serious in saying that he received a black eye from a lump of soap thrown by a poltergeist.

Well, as I was there and it was *my* eye,
C. E. M. Joad: perhaps I might begin by answering that.
I can't vouch for the fact that it was black because I didn't look into a mirror. But it is quite certain that I was hit on the eye, or near the eye, by what seemed to be a hard substance and what subsequently transpired, as they say in Police Courts, to be soap. I couldn't then detect, and I haven't since been able to detect, any agency which could conceivably be responsible for throwing the soap. That happens to be one very characteristic example of the kind of phenomena that you have in haunted houses. They are the most mysterious phenomena known to psychical research because it is almost impossible to think of any reasonable explanation for them. An explanation which has been tentatively suggested, but it is a very long shot, is this. (I said something about it the other week.) There is something which does survive the break-up at death of a human personality, but this something is not a whole mind, not a whole soul, but a fragment of the mind, a fragment of the soul, a thin tenuous current of vital or psychical, I can't say material, say activity. This retains the power of combining with a piece of matter to form a temporary mind so that what once combined with a body to form a human mind is now combined with a bit of soap and causes it to fly through the air as if some demonic or devilish agency were at work. It combines with a bell and makes it ring; it combines with the furniture or other objects in haunted houses, and produces poltergeist phenomena. This is a very long shot and I don't in the least want to suggest that it is an accredited scientific explanation. In fact it is no more than a guess. But the point is, if you accept the phenomena as occurring, they constitute a tremendous challenge to science, a tremendous challenge to Huxley here, to find out what the explanation of these phenomena may be. The trouble is that it is equally difficult to doubt that the phenomena occur or to understand how they can occur.

Julian S. Was anybody else in the room with you,
Huxley: Joad, when the soap hit you?

C. E. M. Joad: Yes.

Julian S. Why couldn't any of them have thrown
Huxley: it?

Well, you have to some extent to trust
C. E. M. Joad: other human beings. It is always possible that the people you are working with are cheating, and you can never be quite sure they are not. In this case there was only one other person in the room at the time, and he was working with me on the investigation. He was in full view at the time and I'd stake my bottom dollar that he wasn't cheating.

Julian S. There are a number of cases where the
Huxley: phenomena seem to be associated with the existence in the house of an adolescent usually of the female sex and of rather unbalanced type, and there is evidence that a good many of these poltergeist phenomena are actually done unconsciously by these young people.

DREAMS

Many questions come from blind listeners. Here is one from Mr. Smith, of Monmouth. He says: "I've heard several times that if we dream we are falling from a height, and that if we should reach the bottom, we would die. Is this true? and does anyone know? Also, is it true that dreams only last three minutes?"

About the first part of the question.
C. E. M. Joad: I don't think anybody knows, because, quite clearly, if they did die when they reached the bottom, they couldn't tell you.

Julian S.

Huxley: They could tell you the opposite, though.

Kingsley

Martin: I believe there are clear cases of people who have dreamed that they have reached the bottom.

Yes, but the point is, if you do die when
C. E. M. Joad: you reach the bottom, there is no means of reporting it. And if you don't die when you reach the bottom, then, of course, you can report it when you wake up.

Julian S.

Huxley: Except that you would think there would be a great many people found dead in their sleep otherwise.

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greater heights be more rarefied, and so the compressibility would be different. By then, flying in that aeroplane would be like being in a motor-car going through terrific mud. It would, as it were, be falling and then climbing up again the whole time.

Wing Commander That is a very true interpretation of the

Helmore: change of flow, because, after all, you start the passage of any object through a fluid by compressing the fluid at the leading edge of the object you're pushing through it. The chief effect on the fluid is compression. Your suggestion about the change in the compressibility of air is therefore probably quite correct.

Julian S. On the other hand that would mean the
Huxley: only chance of getting even faster would be by some form of rocket propulsion, wouldn't it?

Wing Commander

Helmore: It would.

ACCURACY OF BOMBING

Lance-Bombardier Gregory of an Anti-aircraft battery wants to know: "What is the possible degree of accuracy in bombing a munition factory at a height of, say, ten thousand feet?"

Wing Commander The possible degree of accuracy is of

Helmore: course absolute accuracy. In other words, it should be possible with a knowledge of all the conditions to select a tile on the factory roof and hit it. In practice, bombing accuracy from 10,000 feet depends on weather conditions, the type of bomb-sight used, the skill of the individual bomb-aimer, and his co-operation with the pilot of the aircraft whom he has to instruct to get into position. According to the direction of the wind and the speed of the aeroplane there is one point in space which the aircraft must reach and from which it must deliver its bombs in order for them to hit the target. The time of fall of a bomb from 10,000 feet is something of the order of 25 seconds, and if a machine is travelling at 250 miles per hour the bomb must be released about two miles away from the target in order to hit it. The bomb-aimer, by using his bomb-sight, has to forecast

these factors, and the degree of accuracy of his forecast is the degree of accuracy of the bomb fall. For obvious reasons I cannot give the degree of accuracy of our own bombing at 10,000 feet, and most people in this country have a fair estimate of the accuracy of the enemy's bombing. What this estimate is can best be gathered by the fact that it is generally considered safest to take shelter somewhere near the target.

THE FLY THAT FLOORED THE BRAINS TRUST

A Bomber Command Pilot asks : "How does a fly land on a ceiling ? Does it loop the loop, turn upside down before landing, or what ?"

Julian S. I can't answer the question, but I have
Huxley : no doubt that in Professor Gray's laboratory at Cambridge it could be answered. He and his pupils have been studying the flight of flies, but I am afraid I have forgotten the exact details.

Quentin I think that young man had better stick
Reynolds : to his Wellingtons and not worry about flies.

Julian S. I presume it just turns upside-down
Huxley : when it gets near. It sticks to the ceiling by means of adhesive roughened pads on its feet.

E. N. da C. I think that he ought to be told that
Andrade : it is an extremely interesting question, and I am ashamed at not knowing the answer. And don't take it that the Brains Trust is pouring scorn on this question. I feel very ashamed that I have no idea how a fly does it.

Julian S.
Huxley : We ought to try and find out.

Donald Ladies and Gentlemen, the Brains Trust
McCullough : is out !

HUXLEY RETURNS TO THE FLY PROBLEM

Julian S. I was rather humiliated by knowing so
Huxley : little about my own subject last week, so I wrote to a friend who has been

working on the flight of flies with a most elaborate apparatus. He wrote back a most learned letter. The actual problem itself of how the fly lands on the ceiling has not been studied, and I think it would be impossible to study it unless it was done with a very elaborate apparatus of ultra-rapid cinematography. On the other hand, he writes a letter from which I can give you one or two extracts. It says: "One of the flies quite commonly seen flying about in rooms can certainly loop the loop in free flight. Manon, of the College de France in Paris, published photographs in 1934, taken at 1,300 per second, showing flies performing part of that manoeuvre." So we have looping the loop in free flight. Then he goes on to say that his opinion is this: "When a fly comes close to the ceiling, features of the ceiling close above it are seen by the fly to move backwards, relative to itself. This causes a reflex action, a change in wing movements, which makes the fly begin to loop the loop, rotating backwards. At the same time, the forelegs are automatically extended and will grip the ceiling as the fly is about to bump into it. The tail swings up immediately afterwards, and the remaining legs grip the surface. The fly will have come to rest, facing in the direction opposite to its original direction of flight." Now this is his opinion. It does not exclude that the fly might do a sideways roll in certain other circumstances, but it actually has not been settled.

SCHOOLGIRL'S TICKLISH QUESTION

Miss Penelope Wilson is twelve years of age. She is staying on a farm in Hertfordshire, and she asks: "Why do you laugh when someone tickles you, but you don't laugh when you tickle yourself?" Now who is the tickling expert in the Brains Trust? Joad?

I answer that question, not because I'm *C. E. M. Joad*: a tickling expert, but because I have often thought about it. It does seem to me extraordinarily difficult to answer. "Why, when you tickle yourself, don't you laugh?" or rather more to the point, "Why, when you tickle yourself, don't you tickle yourself?" Because if somebody applies the tips of their fingers under my armpits I am extremely ticklish and giggle. If I do it to myself, making precisely the same movements, applying, therefore, precisely the same stimuli

to the armpits, I remain in cold and unimpassioned boredom. Well now, why? One suggestion which I have is this, and it bears upon the laughing. When you laugh when tickled, it is not happy, joyous laughter, it is nervous, embarrassed laughter. I think you laugh, as you often do, when you are embarrassed, in order to hide your self-consciousness and to cloak your embarrassment. Why are you embarrassed? Because really it is an immense affront, an immense infringement of your individuality when somebody starts outraging you by tickling you. It is something which is an outrage upon your privacy. You cannot exactly resent it. It is not an assault, but you can feel nervous and embarrassed about it, and because you are nervous and embarrassed you laugh. Now obviously if you apply your own fingers to your armpits or to the soles of your feet in order to tickle yourself you cannot outrage your own privacy. So therefore no embarrassment and no laughter.

Julian S. On the other hand, your privacy would
Huxley: be just as much invaded if people tried to tickle you on a part of the body where you were not ticklish. It is very complicated, and I think it is partly that subconsciously you know that you are not going to exert your full force on this business of tickling. But there is something very puzzling about it.

Donald There you are, Penelope, you've got the
McCullough: Brains Trust all hot and bothered. You win all the way round. You've knocked the whole psychological and physiological world sideways.

MUSIC LESSONS FROM THE BRAINS TRUST

A girl in the W.A.A.F. in Essex, Mollie Lawson, asks: "What is music?" And Mary Winters writes from Ireland to ask: "Why does it have an effect on the emotions?"

Malcolm I suppose I have to answer this. It is a
Sargent: question I have asked myself a good many times, and have never been able to solve it properly. Strangely enough, many times, particularly at rehearsals or at concerts, I have said to my leader, "Why is this music so extraordinarily affecting?" Why are the first few bars of the *Unfinished Symphony*,

for example, so very lovely, and different from anything else? There is only one answer that I can give, and I know it is not very definite or conclusive. It seems to me that there is something in the heart of humanity which is as deep and fundamental as the feeling, we'll say, of religion. It is this feeling of worship, and love, and respect towards beauty itself. Music seems to be able to get at the spirit of it without bothering at all about the letter. It is able in itself to express beauty without any relation at all to the exterior world, either in shapes or in verbal reference. The result is that if the person has felt this beauty, this emotion, strongly enough, for some reason which I cannot understand it comes through in his music. There's no reason why the first chord of C Major, for example, at the beginning of the *Maestersinger Overture*, should be different from any other chord of C Major, but the moment you have realised what follows, and when you hear it again, it always affects you. Maybe it is partly an association of ideas, but I believe that in the simplest of tunes which are really lovely (a tune like the *Londonderry Air*, or like the first few notes of Handel's *Largo*) the whole spirit of the man is there, and he has already begun to express the beauty which he is eventually going to finish expressing at the end of his piece. But it is already there, and the essence of the good composer is in the man who can keep that emotional intensity throughout his composition; and who doesn't have to hang about with introductions or fill up with padding which doesn't really mean very much. Music is the soul of man speaking to the soul of man through sound; and for some reason sound does affect us, who are equally responsive, in the same way that it affected the person when he wrote the music.

I agree very much with Sargent, but
C. E. M. Joad: just to give a literal answer to the question, "What is Music?" It is a collection of sounds arranged in a pattern. Music is noise, or a series of noises. But what one wants to know is why some music is beautiful and affecting. Why does it arouse emotion, while other music does not? What, in effect, is the difference between, let us say, a piece of Bach and a chorus of cats on the tiles at night? As Sargent really hinted—only to put it very bluntly—there is no answer to that question. It is the great musical puzzle. If you strike half a dozen notes at random on the piano,

you produce a purely physical effect on the ear of the person listening, of which physics would give an account in terms of waves in the atmosphere impinging on the eardrums, and all the rest of it. Strike the same notes in a particular order, namely, in that order in which they make the subject of a Bach Fugue, and you can be thrilled to ecstasy. Now the physical effect, in a sense, is the same, because the physical stimulus is the same. Only the order, only the pattern, is different. Therefore I am inclined to think that the secret of the beauty of music, and therefore the secret of the emotion which music arouses, is to be found in an order, in a pattern, in a structure. I think it is the same also with pictures. The curious thing about music (I'm putting it paradoxically, and exaggerating it, but I want to put it this way) is, it doesn't so much matter how music sounds. What matters is how it is arranged, what the intervals are, and what the pattern is. The beauty of the music is a characteristic, a feature of a particular kind of pattern. There is no answer to why it moves you. It just does.

Julian S. Huxley: There is one point on which Joad made rather a sweeping statement. He said that the physical stimulus in the case of a lot of notes struck at random and the same notes arranged in order is the same. I would entirely disagree. The pattern, when it strikes on the ear, is itself a stimulus. It is a stimulus of a certain order of complexity. I would entirely agree with him that it is the essence of music to be noise arranged in a pattern in such a way as to stimulate the emotions. And why does music stimulate the emotions. There is no fundamental answer to that, any more than why are emotions stimulated by anything. Our emotions are of such a nature that they can be stimulated both by sound and by visual stimuli. Good music is the art of stimulating them in a most effective way, and that can only be done, as Joad says, by arranging them in a particular pattern. It is super-imposing a pattern on to raw sound.

OUT OF TUNES ?

Bombardier Keefe, of Loughton in Essex, asks :
"Having regard to the limited number of notes available in music, will it ever become impossible for a composer to write a new song or piece ?"

Malcolm

Sargent: No more impossible than to say that owing to the limited number of letters in the alphabet you couldn't write another original sentence. The possibilities are quite infinite. It has been worked out in the simplest forms of melody. I've forgotten what the result was, but you can go on with millions of different tunes, even sticking to the scale of eight notes, which is the ordinary standard one. If you allow chromatic scales and modulation you go into more millions of possibilities. There will always be new tunes. At the present time, it doesn't seem to be very easy for people to write new tunes, perhaps because they are thinking of other things. But I am certain that the melodic influence of music will come back after the war, and we shall get many more lovely and enduring tunes.

WHY DOES MUSIC AFFECT US ?

Gunner Ronald Fletcher, of the Royal Artillery, asks : "Why do people feel a thrill when they hear a march well-played ?"

Julian S.

Huxley: That is an extremely difficult question to answer. Why do you feel a thrill, when anything thrilling happens, is the only way you could answer. There are certain types of stimuli—to put it in physiological language—which act on your nervous system in such a way that your glands secrete in a certain way, causing your hair sometimes to stand on end, and so on, and that is what gives you the sensation of a thrill. There may be a thrill of fear, there may be a thrill of pleasure, but they all have in common that certain types of glands and muscles are called into action.

Commander

A. B. Campbell: I think the thrill has a lot to do with rhythm. When you are marching, the band helps you to lift your feet. In ships at sea in the old sailing ship days we used to say a shanty put ten men on a rope, and that had much the same effect. You felt a thrill when the shanty-man set up, and I think soldiers marching, when they hear the band playing, do lift their feet and get a thrill on account of the rhythm.

Harold

Nicolson's I think Campbell is right about the rhythm business, but I think it is something more than that. It gives them a

sense of continuous efficiency such as ordinary independent work doesn't give. You have the feeling that something is moving on in a direct definite direction with a planned order and also with greater speed than it actually develops, because the feeling that the march is going on gives an impression of continuity and speed, greater than the actual movements of the people involved. You feel a sense of wishing to share in this, and at the same time you are sharing in it without moving yourself at all, and that gives a sort of external stimulus to your general pleasure at the rhythm of the tune itself.

Douglas I think it is also true that the human
Woodruff: life is basically a journey. I believe
all the great books in the world are
stories of journeys, and that the ordinary private person
lives with a perpetual sense of not getting anywhere in
particular and the idea of the march is the collective
moving forward to something—no matter what.

POLITICS — UNION NOW ?

An American ferry pilot, serving with the A.T.A. in the West Country, wants to know : "Should the British Empire and the United States of America merge into one United Commonwealth, either now or after the war ?"

Julian S. I am against any constitutional merging,
Huxley: any blueprints of a formal constitution,
and so forth, but it does seem to me quite
essential that we have got to reach some more definite
and more permanent arrangement than we have had in the
past. If we can once secure agreement between the United
States and the United Kingdom, then we shall have got an
arrangement on a world-scale and one which should be to
the interest of Russia to join too. After all, the U.S.A.,
the British Commonwealth and the U.S.S.R. will be the
only three great centres of power and influence left in the
world after Germany is knocked out. Once you have got
your three great world centres agreed on a common frame-
work of policy, you could not need any elaborate constitu-
tion. What will be needed are provisions for economic
agreements on a world scale on such matters as com-
modity control, worked out at periodic conferences between

their leaders, and backed, let us hope, by some permanent international body of advisers and experts.

C. E. M. Joad: I'm a strong Federalist, which means that I think that the usefulness of the single, separate, national, sovereign state is passed, and that there won't ever be assured and permanent peace in the world until single, separate, sovereign national states are superseded. I think we must take away from any single state the power to plunge the world into war whenever the Government of that state, or the dictator in whom the government is vested, thinks it will be to his advantage to do so. This means that I am a Federalist, and it seems to me that the way in which Federalism may come into the world after the war is by a merging of the British Commonwealth of Nations and the U.S.A. under a single Federal Government whose pooled power will be so strong that no other nation dare challenge it. I think that is the best foundation for international peace after the war.

Julian S. Huxley: I agree with Joad in principle. But isn't it a question of how soon we can reasonably expect such a union? Personally, I feel that you are putting too much of a burden on mere machinery if you try for a real union between two powers which are, after all, still very different in their outlook and their traditions and their interests. You must go at it in a step-by-step way.

Then there was a further point that Joad made. He wants to avoid any single power being able to plunge the world into war. I quite agree. But as war is developing now, no small power could plunge the world into war. Any war-mongering power has got to have an enormous industrial potential behind it. So economic arrangements are going to be even more important than political.

C. E. M. Joad: I agree that we must not try to draw up paper constitutions or to make a blueprint of a world Government; before the situation arises in which such a Government becomes possible there must be favourable circumstances; the spirit must be prepared and willing; the stage, in other words, must be set. Only then can political institutions work successfully. In other words, we must avoid the mistake of the League of Nations, the mistake of setting up machinery in advance of the spirit—what one might

call a common consciousness among the peoples of several different nations—which was necessary to work the machinery. Granted all that, I still think that the way in which Federation may come is by Anglo-American collaboration during the war to win it, and after the war to resettle Europe. The habit of co-operation thus formed will constitute the first step in the direction of international government. The machinery of international government will grow out of the situation ; its constitution can come after.

U.S. POLITICAL PARTIES

Miss Denys Ives, of the Civil Defence Service at Ealing, wants to know : “Why are the two chief political parties in the United States called Republican and Democratic, when both are republican and democratic ?”

Harold Laski : The answer, of course, is purely historical. The Republican Party was so-called at the time of the Civil War, and as the result of an amalgamation of different groups that were previously called by other names. The Democratic Party was so-called after the Civil War, as a result again of a coalescence of groups in the South. They both are Republican, they both are Democratic. Indeed it would be very difficult for anyone to draw any clear distinction between them. I think it would be broadly true to say that the Republican Party is rather more in favour of a high tariff than the Democratic Party, and that the Democratic Party is built very much more on support from the South than is the Republican Party. But, in essence, the real distinction between them turns on the different persons by whom each is led in an election or between elections.

AN M.P.'S DUTY

Mr. Sweetman, of Exeter, asks : “Is a member of Parliament justified in voting on any measure before Parliament in opposition to the known wishes of the majority of his constituents ?”

Harold Nicolson : I should say, certainly, and without question. He may have to explain afterwards to his constituents or his association why he took that decision ; he may even, if he feels the feeling in his constituency is very much against him

So far as Nazism is concerned, I should say that its essential doctrine is the conception of the individual as a mere cell in the living body politic. He is not a person on his own account, endowed with separate being, possessing his own rights, and entitled to pursue his own purposes, but stands to the community precisely in the relation in which a cell stands to the living body of which it forms part. Hence the conclusion—and I take it to be the essence of Nazism—that the individual has no purposes save those of the State, no freedom in the State, and no rights as against the State. Hitler, for example, has said: "The dogma according to which the individual person has a right to his liberty and to his dignity can bring nothing but destruction." Communism and Nazism are, therefore, both opposed to Liberalism, which puts the individual first, but opposed for different reasons.

THE COMMANDER'S SOUTH SEA "BRIDE"

Miss M. Reynolds, of Pembrokeshire, asks: "How did marriage originate? When was it first licensed, and why?" Come along, Commander Campbell.

Commander I don't see why you call on me. Though,
A. B. Campbell: as a matter of fact, I've seen very many curious ceremonies. In fact, I understand I got married myself once in the South Sea Islands through eating a piece of fish with a girl. But I can't attempt to explain or suggest whenever it was first invented.

Julian S. Huxley: I don't think anybody knows when marriage was instituted. It is one of those things which have grown up gradually in the prehistoric past. Its obvious aim is to stabilise family life. The production of offspring must be a basis of life in society and therefore marriage is a contract—a social contract, which is concerned with stabilising that relationship of production of offspring to society.

QUESTION OF INTELLIGENCE

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Julian S. It is rather like asking why some people have got blue eyes and some brown.
Huxley: It is due to differences in heredity, as a matter of fact. This question of intelligence isn't so simple as eye colour because what we call intelligence is a composite affair. It results from the interaction of something which is given you by heredity with the use you choose to make of it. Intelligence is partly the result of your heredity constitution, and partly the result of your training, whereas nothing that you do or that happens to you after birth will alter the colour of your eyes.

Kingsley The interesting thing about that question, I think, is this: a hundred years ago, or a little more, most scientists would have given the opposite answer to the one that Huxley has now given and which seems quite obvious to us. To us, it seems quite obvious that there is an innate difference in intelligence. But the people who were mainly responsible for the theory that underlies our modern method of government actually thought that children were born with minds like blank sheets, on which society wrote its story, and which developed entirely through environment. Since this is now quite clearly untrue, there tends to be reaction; people now go to the opposite extreme and put down all the differences to heredity, leaving out the enormous importance of environment. When you analyse different schools of political and social thinking, you always find yourself back to the question; some people put all the emphasis on innate differences of intelligence; others attribute more to environmental causes.

C. E. M. Joad: There are just two things I would like to add. The first is this: What seems to me really to dish the theory that differences in intelligence are wholly due to environment is the appearance of traits like the ability to play chess—something approaching chess genius in very young children is a well-known phenomenon—or immense musical talent in young children whose parents are almost entirely destitute of musical capacity. It is extraordinarily difficult to put such qualities down to environment, and I should have thought that it was almost equally difficult to ascribe them to heredity. Such cases may constitute a reason for believing in reincarnation—the boy may have learnt his

chess in another life and remember what he has learnt; or it may be that we cannot say any more than that that is the way in which God made him. I just want to suggest these as possible additions.

The other thing I want to say relates to that part of the question which we haven't yet dealt with. "Is it because of a different formation and composition of the brain?" we are asked. Now there is, I gather, *some* degree of correlation between the brain and the intelligence. The relation is not that a very intelligent person has a much larger, but that he has a much more highly complicated, or, if I may use a technical word, articulated brain. Look at the brain of an intelligent person and compare it with that of a half-wit. There are many more convolutions, more whirls and twirls and holes and complications of pattern in the former than there are in the latter. The grey matter which composes the cortex is more wrinkled, while in the case of the half-wit it is smoother and less broken up.

Julian S. Huxley: You do find a general increase in the complexity of the convolutions as you pass up in evolution from the lower mammals, through the monkeys and apes, up to man, but the state of the convolutions alone wouldn't tell you anything about differences in intelligence between normal people. There must of course be a correlation between intelligence and the conformation of the brain, but we don't yet know exactly what it is.

The point that Joad raised about genius is a very interesting one, but actually it is one which the modern theory of heredity has helped to explain. Heredity in the old sense meant being like your parents, but according to our modern theories of heredity, based on Mendel's work, new recombinations of character are bound to crop up in each generation as a result of the shuffling and recombination of your hereditary particles or genes. On this view, which is now very well founded, genius is the result of an exceptional recombination of genes.

ARE THOUGHTS THINGS ?

Mr. W. E. Jack, of Keynsham, asks : "Are thoughts things, or about things ?"

C. E. M. Joad: It all depends on what you mean by a thing. We have all been brought up in a world whose outlook has been

dominated by science. As a result of that, we think that if a thing is to be real at all, it must be something which you can see and touch, and which occupies space. Therefore, we have come to think of the notion of a thing as applying to a piece of matter, something which can be seen, something which can be touched, something which occupies space, something which happens at a time. In other words, we think of a thing after the models of the notions that physics and chemistry have put into our minds. In that sense thoughts are quite obviously not things, because a thought is something which occurs in your mind. Your mind is not something that can be seen and touched. If you cut open a man's head and look inside you see a brain, but you don't see a mind. A mind doesn't occupy space. There is no more point in saying that a man's mind is in his head than in saying that it is in his big toe. It isn't anywhere. It is meaningless to say it is anywhere. Therefore according to the definition which I suggested of a thing, a mind is not a thing. Therefore, a thought which is something which occurs to or in a mind (we shall have to use the word "in") is not a thing. Now are thoughts about things? The answer is, yes, some are and some are not. I can think about tables and chairs and people, then I'm thinking about things—in so far as people have bodies. But I can also think about civilisation, the British constitution and the nature of the Universe, and then I'm thinking about what philosophers call concepts, which are not things in the sense which I have tried to define things. They are not material and they are not in space. So the answer to the question is that thoughts are not things; they may be about things and they may be about concepts which are not things.

THE CREATIVE MIND

Sapper H. R. Everard asks: "How does the creative mind work?"

C. E. M. Joad: There is a good answer in Aristotle. He is thinking about creation in thought, more particularly mathematics, philosophy and so on, and he says that the essence of new thinking consists in the ability to perceive what is similar in things which are apparently dissimilar. In other words, the creative mind establishes the relations between things

whose connection had not previously been observed: Newton between falling apples and gravitation; James Watt between the lifting lids of boiling kettles and the power of steam; Pavlov between the saliva of dogs and the conditioning of reflexes. I think that in art what we call creativity is rather different. I think that the creative person in art is a person who sees beauty and significance where it has not been seen before. In literature and drama and morals, the creative person is a man sent into the world (because I think that a creative genius is not just an accident) to give conscious expression to life's instinctive purpose; that is to say he gives a thrust forward to the evolutionary process.

J. B. S. You've told us, Professor Joad, what the creative mind does, you have not told us how it does it. My view is that you go over a vast mass of material, you become familiar with it and then quite suddenly something happens with a click. You see a new idea or a new form. I should say nobody knows in the very least how that is done. But it is done at a level below consciousness, and it comes to the surface in a most inappropriate occasion. The three best mathematical ideas I've had in my life—one happened in a night-club where there were two jazz-bands playing, and I was doing sums—and another when I was under cross-examination before a court martial with a view to possibly being shot, and a third while driving a motor-car through traffic. And I haven't the vaguest idea how those ideas came up.

Julian S. Haldane has put it very well, the way certain types of mind work. But it is pretty clear, isn't it, that the creative mind can work in a number of quite different ways. There is the intuitive type of mind which will work as Haldane has described. Another type of intuitive mind is that represented by the mathematician Poincaré. He described how he would worry and worry about some difficult problem, and then the solution would suddenly come to him weeks later, after he had given up consciously thinking about it. It seemed to float up out of his unconscious. But there are also many people who have a more classical type of mind. They will see that some problem is interesting, and then will amass fact upon fact until the facts themselves give the solution. The man who defined genius as an

infinite capacity for taking pains was thinking of this type of mind. In such cases, too, there is real creativeness, but the creation emerges by the fitting together of many small bricks of fact.

PRODUCERS—BY LESLIE HOWARD

Aircraftman Crook, of the Royal Air Force, is puzzled by the different uses of the word "producer" in the entertainment world. He is very anxious to know how the work of a stage producer, a film producer and a radio producer differs.

The term producer might mean anything and is generally misapplied. In actual practice, a stage producer is a man who actually directs the actors during the rehearsals of the play and brings it to life. Now the film producer is simply a business man. A film producer sits in an office, makes the plans, finds the money, engages the studio and the actors, and signs the contract. I don't want to be rude to film producers but he really is nothing more than a very elegant form of book-keeper. Actually the man who performs the function of the stage producer in the films is known as the director. He is the man who puts the thing on. He is the Frank Capra. He is, to my mind, the most important man in the whole medium. If anything ever comes out of the film medium it comes as a result of the director, and almost nobody else. The radio producer, I take it, is the same as the stage producer. I'm not so sure about that. Is the radio producer the man who actually directs the performance, or is he really the man who makes the business arrangements of the performance?

Donald McCullough: On the radio he is the genius responsible for seeing that the show is bearable from the point of view of the audience.

Julian S. Huxley: I would just like to ask Howard, don't the producers sometimes take a hand in, what one would usually call, the direction?

De Mille, who did *Sign of the Cross*, was a producer, wasn't he?

Leslie Howard: No, strictly speaking, De Mille is a director. That is his profession. But a director, in order to escape the machinations of the producer, sometimes tries to become a producer himself, which is what De Mille did. It is the aim of

all directors to become producers, because thereby they avoid the producer.

TRAVEL

Sergeant Ross, of the Royal Engineers, puts this question : "Travel is supposed to broaden the mind. Is this true ?"

Captain Peter Fleming: I think that when you are travelling you can't help, obviously, broadening your mind and broadening your experience by seeing remote places and strange people. On the other hand, if you get involved in a long journey through a desert or something of that kind, I don't think that during those days when you're going slowly through monotonous country your mind is broadened. Partly because you think only of either food on the one hand or water on the other, and partly because you come to lead a life like an animal's, so that, although you may do a certain amount of meditation, I should say your general intellectual state is pretty stagnant.

C. E. M. Joad: I would like to say something about that from a rather different point of view. One always thinks travel broadens the mind, but there are two facts which seem to me to be important. There has never been a world in which there has been so much travelling as the world of the last forty or fifty years. The world has grown small. We are all brought into contact with one another, and there has never been so much ill-feeling in the world. Never have the nations disliked each other so much as they have done since they have known so much about one another through travel. That is the first point, and it makes one sceptical. The second point is this. Most people when they talk about travel don't mean what Fleming means. What they mean is going on a conducted tour in the course of which they only meet taximen, porters, commissionaires, hotel-keepers, waiters in restaurants, who certainly don't broaden their minds, though they do empty their pockets. From the point of view of nineteen people out of twenty who travel, there is no mind-broadening because there is no contact with the people of the country to whom they go. They only meet those who are organising their travel for them. Now all that is sceptical and pessimistic. What

I refer to food. Breaking down food prejudices is enormously important, especially when you are young.

BIRD'S NEST SOUP

Mr. G. Dunn, of the Royal Navy, wants to know which birds make the nests from which bird's nest soup is made in China. He asks how it is made, and are there any British birds' nests that would be suitable?

Margery Fry: It so happens that I have a friend who comes from the East Indies (it's not in China that these birds build, for the most part) and he had the extraordinary good luck to have a family house which became a home for these birds. They are a kind of swallow and I think—Oh, Doctor Huxley shakes his head—I thought they were a swallow. Anyhow, the less we say about how they make their nests the better. I can only say it is not more disgusting than the way in which bees make honey. A great deal of very good money comes from it to anybody who can own a birds' nestery, because these delicious things are exported to China and to a certain extent to other countries. I must say they make the very best soup in the world.

Julian S. They are a kind of swift, Miss Fry,
Huxley: which, of course, looks rather like a swallow but is a very different type of bird. Actually, they make it with their saliva, don't they? There is no other bird as far as I know which resembles them at all in doing this.

Yes, but if you were asked to take the
Margery Fry: swift's saliva straight away, you would perhaps be a little disgusted. As it has passed through the process of being a bird's nest, you can eat it without alarm.

HUXLEY ON FISH . . .

Fourteen-year-old Tommy Spalding, of Weybridge, wants to know: "How can you tell the age of a fish?"

Julian S. You can tell the age of a fish chiefly in
Huxley: those fish which have well-defined scales by counting the rings on the scales. It is not unlike counting the rings in a tree, but it is rather

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more complicated because they do not always only put on one ring in a year. Sometimes they miss a year, so that the ages are not always quite accurate. But the fishery people have made quite a job of finding a fish's age from his scales and it works pretty well. Another method is to look at the bones in their ears which give them a sense of balance. Those also have rings which are put on every year and in some ways this is more reliable than the scales.

. . . ELEPHANTS . . .

Mr. Robert Knight, of Shaldon, would like the Brains Trust to explain "Why are the larger animals, such as elephants and rhinoceroses, not found in America, but only in Asia and Africa?"

Julian S. The first thing to remember is that they
Huxley: were found in America before the Ice Age, and they've been exterminated during the Ice Age. We simply don't know why conditions were so different that the big changes of climate in the Ice Age caused more types to become extinct in the New than in the Old World. But we must also remember that a great many large animals were exterminated during the Ice Age in the Old World. Among the rhinos and elephants, for instance, only the tropical species have survived. The mammoth and the woolly rhinoceros died out.

Commander In Patagonia there are caves containing
A. B. Campbell: round balls of grass which evidently are food for some huge creatures—I've seen that there.

Julian S. These were the giant sloths, which
Huxley: survived in South America down to comparatively recent times, though they died out during the Ice Age over the rest of the New World.

. . . KANGAROOS . . .

Mr. A. B. Bartlett, of Charlbury, wants to know how does a kangaroo keep its pouch clean—if it does?

Julian S. I have only once seen a kangaroo doing
Huxley: anything to its pouch. That was a tree kangaroo in the London Zoo. She was cleaning out the inside of her pouch with her hands, much

as a lady might clean out the inside of her handbag, except that here the bag was attached to the lady, so to speak.

Commander The Australians tell me that no one can
A. B. Campbell: tell actually how a kangaroo is born.

I have seen little kangaroos in the pouch, not bigger than the top of the finger, perfectly formed and white in colour.

Julian S. That's perfectly true. But they have the
Huxley: extraordinary capacity (even though they are in every other way a mere embryo) of being able to crawl up from where they are born and to find their way into the pouch and attach themselves to the teat. That has been observed now with opossums and kangaroos. By the way, the negroes in the Southern States of America believe that opossums are born by being sneezed out of their mother's nostrils! But of course that's just a myth.

. . . COBRAS

Miss Anne Fleet, of Kenton, Middlesex, asks :
"Is it true that music fascinates cobras and stops them from attacking? Can you explain this charm, and does it ever fail?"

Commander I have seen cobras fascinated in India
A. B. Campbell: by flute-playing. I remember once in Bombay, it was Armistice Day, and the troops were all lined up on board. A native came aboard to show this trick. It was just at the two minutes' silence, and all stood to attention on deck. He placed his basket on the deck. Slowly the lid of the basket lifted, and one of the cobras wriggled out. It took some nerve on the part of the troops to stand the rest of the two minutes' silence while this thing was slithering around the deck. Then the native came along and started playing the flute, and back the creature came and crept into the basket.

Julian S. I, unfortunately, have not had the
Huxley: advantages of Commander Campbell in travelling about the Eastern parts of the globe, and other places, so that I have never seen this actual business of fascinating cobras, which undoubtedly does happen. But, as far as I remember, there have been some experiments which indicate that the so-called fascination is clearly very real, and is chiefly done through the

sense of sight rather than the sense of sound. Sense of sound is an accident which is trained through the sense of sight.

Malcolm I have watched this snake-charming business, and it is interesting to note that the type of music is hardly important. It doesn't matter whether it is good music or bad music. It is just a sound, and a continuous sound, which has a sort of mesmeric effect upon the snake. But then this is true of many other animals. Almost all domestic animals are influenced when you play the piano. Your canary, or the budgerigar, knows when music is taking place. I have a small budgerigar at home who simply adores a vacuum cleaner, which sound I can't bear, but it immediately breaks into song. It would seem that in the case of animals whose listening powers are great, and are affected by sound, the continuous sound of music is really the thing that matters. Intermittent notes would not be nearly so effective. It is the long sound the man plays on his flute (it doesn't matter what he plays) which interests the cobra and makes him for the moment not dangerous, because his attention is centred elsewhere.

Julian S. I can't remember the experiments off-hand, but I think that if you play the music without being seen, it does not have an effect, which rather indicates that it is a visual thing. You can hypnotise a great many animals, or mesmerise them, or whatever you like to call it, by causing them to fix their gaze on something close. A standard example, of course, is the hen on a chalk line. I am just wondering whether it is because the flute is being played near the cobra's nose that he fixes his eyes on it and it mesmerises him, possibly with the little additional help from the continuous musical sound.

Malcolm I don't think it necessarily is, for as far as I remember with the snakes, they are not always facing the instrument concerned. They turn about, and when they come out of the basket, they obviously find out where the sound comes from. Playing from behind a screen would be almost equally effective. Certainly it is with dogs and cats. A dog will come to a piano (or perhaps run away from a piano!), in any case it is influenced by the actual sound, and it does not necessarily have to see it.

Commander The snake-charmers start with the
A. B. Campbell: basket closed. They start playing low
 notes on their flute or reed, and slowly
the lid of the basket raises—forced up by the snake—
so the cobra doesn't get any visual effect from the com-
mencement.

“SECOND THOUGHTS”

Julian S. I've looked up the facts and I've got an
Huxley: authoritative statement here from a
 book on *Hearing in Man and Animals*,
by Dr. Beattie, who is a great authority on the subject. He
says that whereas most reptiles have good hearing, in snakes
a striking variation occurs, for the eardrum is absent, and
the outer end of the columella (that is the little bone which
transmits vibrations from the eardrum to the internal
ear) is attached to another bone of the skull. This renders
the snake deaf to airborne sounds while preserving its
hearing for the footfalls of approaching animals, and sounds
conveyed through the ground and through the snake's
body. Such sounds of course won't be nearly so definite,
and snakes won't be able to receive musical sounds in the
same way as we do. The cobra, he adds, when it sways to
the music of the snake-charmer's pipe, is following the
rhythmic motion of the performer's body, and not the lilt
of the tune. The same tune played by a hidden musician
leaves the cobra indifferent. So one can only conclude that
the fact mentioned by Campbell, that the snake-charmer
begins by playing his pipe when the snake is inside the
basket and yet it comes out, is that sufficient vibrations
are transmitted through the ground. The snake feels that
something is happening and, being inquisitive, it comes out ;
and then the rest of the performance is determined wholly
or mainly by sight.

CAN ANIMALS THINK AND COMMUNICATE ?

Aircraftman Edwin Rudd, of the Royal Air Force,
asks : “Have animals and birds a language of their
own by which they can communicate with others
of their species ? If not, how do they, in fact,
communicate ?”

Julian S. It all depends what you mean by language. If you mean do they have words as we do, then the answer is "No." They do not have words to denote things, to denote their own words for nouns. If you mean, can they communicate, certainly they have a language. I would say they have a language, but they have no organised speech as we have. A particular kind of bird may have, say, sixteen different call notes, all of which mean something. A call note may mean anger, fear, or hunger. Such sounds are taken as meaning those things by others of the species. How exactly that is done, whether it is inherited or learnt, or whether it is a combination of the two, we do not know. But even the highest animals do not have a language in the sense of human speech. A chimpanzee, for instance, can make it quite clear that he wants a banana if he sees it, but what he is really saying is with his gestures. And let us not forget that gestures are just as important a part of animal language as speech, just as they are in many human beings. The chimpanzee can say "I'm hungry," If he looks at the banana, he can say "I'm hungry for that banana" by looking at it. If the banana is not there, he can't say "I want a banana." That is the fundamental difference between animal language and human language.

C. E. M. Joad: How do you account for parrots? The parrot must be a copyist, I suppose. Because I know parrots who have used really remarkable thought in their expressions.

Julian S. Parrots, like any higher animal, can associate ideas. There is no doubt that they do so, but their main gift is simply one of imitation, which many birds have. What on earth the biological meaning of this gift of mimicry is, goodness knows. To put it the other way round, many parrots, though they have this gift of imitation, often get it mixed up in such a way that it makes no sense. I was taken once to see a budgerigar which had 170 different phrases, and they tried to teach him to say "Good afternoon, Dr. Huxley." He didn't say very much that afternoon, though he said something about "Huxley." That was all, but a few days afterwards he was heard by his mistress to say: "Dear little Hux, have some seed!"

CAN ANIMALS REASON ?

Mr. James Moore, of Bush Mills, Northern Ireland, asks : "Have animals the power of reasoning ?"

Julian S. Like so many other questions, that
Huxley : depends on your definition of reasoning.

Personally, I would say that they have not the power of reasoning in the strict technical sense of the word—that is to say, of drawing general conclusions from premises in a way which implies abstract thought. What higher animals certainly do have is the power of profiting by experience, which is the first big step up from pure instinct towards reasoning. And a few mammals, notably apes, do have what psychologists call insight, which means being able to understand a problem as a whole, instead of just trying at random and sticking to results which happen to work.

THE ANSWERS ARE SPONTANEOUS

Corporal Barber, of the Royal Engineers, says : "Are you prepared to offer any proof that these questions dealt with on the air are definitely not known to the learned gentlemen who discuss them prior to the broadcast ?"

Julian S. If you had a Bible here, I think we
Huxley : would all be willing to swear it. But as it is, they have just got to take our word for it.

E. N. da C. I think they would be very much better
Andrade : answers if we had some preparation. The mere fact that we quarrel with one another, and are not quite certain, is evidence that we have had no preparation, I think. Personally, I would be prepared to be much more dogmatic if I had fortified myself beforehand by a little thinking.

C. E. M. Joad : I would like to retort with a question to Corporal Barber. Has he ever reflected what proof is, and what does he mean by a proof, and what would he accept as a proof if it were offered ?

SECTION TWO

"PRODUCING THE BRAINS TRUST"

By Howard Thomas and Douglas Cleverdon

Every week the question comes in from somewhere or other: "If 'Any Questions?' is a spontaneous programme, why does it need producers?"

The Brains Trust Book gives us a chance to reply in public. In private our answer is hardly suitable for broadcasting, for the question usually arrives on a day when there are two thousand letters and postcards to be examined, the week's guest speakers have failed to confirm whether they can attend, the *Radio Times* is closing for Press, and there is talk of one of our "resident experts" leaving for America on the next "Clipper."

In the theatre, the producer is the man who brings the playwright's words to life, and guides the actors through every word and action. In the cinema, the producer is more or less the business manager of a picture, allocating the work of interpretation to a director. In radio, the producer originates a programme, organises it, rehearses it if it is a musical or dramatic production, and steers it to glory or to the limbo of forgotten programmes. Either the radio producer puts forward an idea and eventually launches the result on the air, or he is given a line of policy and asked to build a programme on that foundation.

"Any Questions?" was produced to order. The B.B.C. Forces Programme planners decided that there was scope for an information programme, for "education in its lightest form, for useful knowledge to be supplied over the microphone in pithy, entertaining and authentic form." It had to be "serious in intention, light in character." Across the Atlantic there was a well-established programme, "Information, Please," but this was a quiz programme

rather than an attempt to give listeners new lines of thought. There, listeners were challenged to dumbfound the experts. Cash prizes were given to the listeners who sent in questions the experts could not answer. This meant there were many catch questions, or questions that could easily be answered by turning to an encyclopædia or reference book. Our problem was to invent a programme which would have the entertainment value of "Information, Please," but which listeners would accept as a serious contribution to their knowledge.

Finally the producers put forward, in a formidable six-page memorandum, what is now known as the Brains Trust programme. "Any Questions?" is its official title, but listeners will have it otherwise. At the beginning, we purposely kept the "Brains Trust" description out of the *Radio Times*, because it looked pretentious in print. But we used it casually in the programme. The phrase caught on, and to-day, whatever the B.B.C. may label the programme, it will always be "The Brains Trust" to listeners.

Much depended on the choice of those who were to take part in the programme, and long lists of names were prepared. For a permanent nucleus, we needed three men who were well known, who were potential radio personalities, and who could speak knowledgeably, briefly and wittily. They had to be considered both as individuals and as a group. The result was the present team—Julian Huxley, the biologist and scientist; Cyril Joad, the philosopher; and Commander Campbell, a man of the people, speaking from experience gained not in universities and laboratories, but in widely scattered parts of the world. Here, then, were three men who were competent to cover a wide range of human knowledge. To them would be added guests who had won reputations in law, mathematics, science, music, and all the other subjects in which listeners showed interest.

All this radio dynamite could not be let loose on the air without someone to handle it with care. It was easy to coin the title of Question Master, but filling the post was more difficult. Broadcasting has produced three or four popular chairmen or games masters, or whatever you like to call them, but the use of any of these in "Any Questions?" would have taken away the freshness and novelty of what we were planning. The programme needed a new broadcasting figure, a man of tact, chairmanship, experience,

self-assurance, sense of humour, and five or six other qualities. The answer was Donald McCullough.

"Any Questions?" was first broadcast in January, 1941. It was scheduled for six weeks, to be broadcast to the Forces for half-hours on Wednesday afternoons. It is still running. It has been promoted to a peak time on Sundays, increased to three-quarters of an hour, and repeated during the week. The programme for the minority was wanted by the millions.

This popularity of the Brains Trust gives opportunity for continual argument, not only with listeners who have views of their own on how "Any Questions?" should be run, but between ourselves as well. What, for instance, is the reason for its popularity? Is it due primarily (as one of us thinks) to the entertaining way in which it is presented, with McCullough's infectious good-humour, Joad's responsive laughter, the occasionally frivolous questions? Or is it (as the other thinks) because listeners really are seriously interested in the questions, and want to know what answers can be given by men who have spent their lives in study of their subjects? No doubt each factor has its importance. But in any case, it is (to say the least) an interesting social phenomenon that for three-quarters of an hour every Sunday afternoon several million Britons are listening to discussions on such matters as the origin of life, or the difference between Eastern and Western philosophy. Nor is it, on the part of listeners, a merely passive absorption of experts' opinion. Reports suggest that in most cases "Any Questions?" is followed by further argument among listeners themselves—in the Ack-Ack site, in the family circle, in the Army canteen, even (it is said) in Senior Common Rooms at the Universities. This kind of success is always dangerous to producers, because once you have steered a programme through all the hazards of Programme Planning and Listener Research, there is a temptation to stretch yourself out comfortably on the mailbags and let the programme take its course. The truth is that programmes of this kind need all the more attention if their freshness and vitality are to be retained. There must be regular injections of new ideas. For instance, when "Any Questions?" was lengthened from thirty to forty-five minutes, we thought this might be something of a strain on listeners as well as on the Brains Trust; so we introduced a half-time refresher, "Second Thoughts," in which one of the three residents could monopolise the microphone

for four minutes and mop up questions not fully answered in previous sessions.

It pays the producers to study the mail carefully, to find out when listeners are growing tired of certain people, certain questions, certain subjects. It is the producers' job to anticipate criticism, to make changes before interest flags, and, in a programme like this, to ring the right kind of changes with guests and questions.

Dealing with the mail itself takes a day or two in every week. Every letter and post-card is read by one or other of us. Allowing an average of fifteen seconds each, 2,500 questions take ten hours' solid reading. In wartime, expense and shortage of staff make it impossible to acknowledge all the questions, but more than a hundred letters a week are written to listeners who send stamped addressed envelopes and ask for definite information about answers already given, such as lists of books. Then there is the selection of suitable questions, followed by the subdivision of these under different headings for immediate or future use, and finally the choice of ten or fifteen contrasted questions for the next programme. In this final choice, we have to allow scope for the guests, earmarking for each of them at least one or two questions on their special subjects. In addition, we need a couple of "warming-up" questions in which everyone can take part before the programme commences. When the questions are finally chosen, one set goes off to the Question Master to browse over, and another goes to an official answerer. In case the Brains Trust disagrees, or cannot supply an answer, we like to have an official answer which we can quote. The man who writes these is unknown to the Brains Trust, and spends his days in libraries searching for facts and checking his answers.

Besides selecting the questions, the producers have to choose the guests. Not all the guests have been successful; but listeners must remember that a Brains Trust session is something of an ordeal, especially when Joad, Huxley and Campbell are waiting ready to pounce on an inadequate answer, and when millions of listeners are matching up their own knowledge. You have to know your own subjects (and several others), and have a ready tongue and a quick wit, if you are going to keep up with the Brains Trust. We get many letters from listeners asking if they can appear on the Brains Trust as "the man in the street." Our answer here is that the conditions would have a paralysing

effect on any but the most experienced and confident speakers.

The assembling of all these busy people on one given day is often a complicated business, and this routine side of the programme has cost the producers many headaches. But at last the day arrives when a full quota of experts has been assembled, a suitable studio secured, and the questions finally selected.

The Brains Trust is seated round a table, with a single microphone on the centre. The placing of the members is important, so that those with lighter voices can be heard, and newcomers can be under the watchful guidance of the Question Master. Joad and Huxley are seated directly opposite each other so that they can argue in comfort, without having to turn their heads away from the microphone. There is a preliminary warming-up, with the guests trying their hand at not-for-broadcasting questions such as "What do you think of the B.B.C. interval signal?" This gives the producers and engineers a chance to balance the respective voices, to confirm microphone positions, and to give guests an idea of how the programme works. When McCullough reads out the question, anyone who wishes to answer has to hold up his hand, but is not allowed to speak until McCullough announces his name. This serves the double purpose of identifying the speakers and preventing the overlap of voices. But from time to time, a guest expert forgets this regulation in the heat of argument, and breaks in unannounced.

It is extraordinarily difficult to convince listeners that the answers are completely unrehearsed. Even the controlling engineers who attend the session cannot always believe their eyes. On one occasion an engineer who had been watching the Brains Trust at work through the window of the listening cubicle turned to the producer and said, "Are they using scripts?" Actually, it would be impossible for any but the most experienced actors to read a prepared script in the completely natural manner that characterises the Brains Trust. The B.B.C. guarantees that the experts have no idea what the questions will be until they hear them at the microphone. If they had, their answers would be duller, longer, and less provoking. It is the spontaneity, the slips, the verbal clutchings in mid-air, and the occasional flooring of the Brains Trust that listeners enjoy.

At last the programme begins. The announcement over, McCullough makes the introductions and sails into the

first question. The producer in charge of the session sits behind McCullough, but away from the Question Table. The producer has to try to gauge the response of the listener, and when he feels that a discussion is getting too wordy, he passes a note "Close" to the Question Master. The timing of questions is important, if the balance is to be maintained, and the producer, away from the heat and nervous excitement of the discussion, has the most objective view. Sometimes, too, he will change the order of the questions during the session. Perhaps after a long answer on philosophical lines by Professor Joad, the producer will signal the Question Master to bring forward a question about the habits of snakes, which Dr. Huxley can probably answer in half a minute.

The programme nears its conclusion, and the producer gives a signal indicating there are two minutes to go. McCullough watches the clock, and steers the programme to a neat finish. Out goes the red light. The Brains Trust can relax; but usually they begin to argue about some point which has arisen during the session.

The producer's work is over—until the next morning's post comes rolling in. It is hardly an unbroken peace until the next session, because there is always something to be discussed with the regular members, hints to those who talk too long, suggestions to the one who is handling the week's "Second Thoughts," as well as the many arguments with all the Brains Trust about the sort of questions they want to answer!

The Brains Trust could easily be a full-time job for the producers, but each of us had two or three other programmes to handle every week. With a sigh we turn to the ever-mounting mail. A letter from a Rotary Club. "We propose running a Brains Trust of our own next week, will you . . ." From a schoolgirl, "Would you please ask the Brains Trust to autograph . . ." From a listener, "I enclose a ten-page article I have just written on yesterday's question of how a bullet fired from a bayonet rifle . . ." From a Joad fan, "I'm a lonely frustrated widow . . ."

And here it comes again: "If the Brains Trust is unheard, why does it need producers?"

"COULD YOU HAVE ANSWERED THESE?"

Listeners to "Any Questions?" like to match their knowledge against the Brains Trust. Often the man by the fireside believes he has a better answer than the man at the microphone. Here is a chance to test your own knowledge, to imagine yourself in the Brains Trust, or to form your own family Brains Trust and answer these 100 questions sent in by listeners but never used on the air. Watch the clock, and remember that it takes the Brains Trust an average of four to five minutes to discuss and answer a question.

How long has the custom of shaking hands existed, and what was the origin of it?

Skyscrapers are said to sway some distance in a very high wind. Why do they not topple over?

Does dew rise or fall?

Why is it that a person talking in his sleep, or shouting during a nightmare, often awakens his neighbours, yet sleeps on quite undisturbed himself?

Taking everything into consideration, who gets the most out of life and enjoys it most—women or men?

How is it that in the British Isles the rule of the road is "Keep to the left" while in most other countries, including U.S.A., it is the reverse?

What is scent?

Why does a cat lick from the opposite side of the plate?

How do cobwebs accumulate?

Can you tell me why people are various heights?

Why are all cats, which I take to be animals of the jungle, so fond of fish?

Which emotion is predominant in governing the life of a man—fear, hunger, or sex-urge?

Seeing that intermarriage of black and flaxen hair has produced our national mouse-colour, why is it that red hair persists in all its glory, notwithstanding constant dilution?

How do migratory birds find their way?

Does the sun's rays, shining on an ordinary household fire, tend to put it out?

Can the Brains Trust please tell me the origin of the tale that babies are brought by storks ?

How does Brighton Rock come to be stamped with the name of that illustrious town throughout ?

Which are the Seven Seas ?

Why is it that, when seen on a cinema screen, the wheels of a carriage or motor-car appear to revolve backwards, when the vehicle is moving forwards ?

Does the Brains Trust consider the duties of a joint appointment are carried out better by a man and wife, or by a single person ?

If the Brains Trust were to have a signature tune, to begin and end their broadcast with, what tune would you suggest ?

Can you tell me, please, why butchers in England wear straw hats whilst serving in their shops, summer or winter ?

Why does frost invariably make the same beautiful fern-like pattern on glass ?

Which is the oldest science of all—Astronomy or Agriculture ?

Is punishment a cure for crime ?

Why does a hot iron press clothes ?

What is conscience, and how does it work ?

What is the reaction of the juvenile mind to the savagery of the farmer's wife who used a carving knife to cut off the tails of the three blind mice ?

Why can a man *pull* a weighty load (trek-cart, garden roller, etc.) *up* an incline when it may be impossible for him to *push* it up ?

Which was the first civilised race, and where did it exist ?

Why are white cats deaf ? We are told this is invariably so—can the Brains Trust tell us ?

How do homing pigeons always manage to find their way home ?

What is the cause of people walking in their sleep, and is there any cure ?

Why, when you place a shell from the sea shore to your ear does the sound of waves occur ?

Why do we never get an orange with a maggot in it, and does the maggot get in an apple from the outside or the inside?

What is fog? Is it smoke (it smells and tastes like it)? If so, where does it all come from?

What is temper?

For what reason is the residential end of a town or city invariably in the West?

Are you in favour of the creation of a Ministry of Art, and what powers would you give it?

How do the stars keep up in the sky?

Is a censor of postal correspondence entitled to divulge any matter to third parties which may be discovered in correspondence, other than that of military value to the enemy?

Why is water wet? The fact that it is liquid does not explain "wet."

Why do birds have different forms of movement? A sparrow, blackbird and thrush hop along—the starling, jackdaw and crow walk.

We have two fairy rings on the lawn, perfect circles, and about 7 feet in diameter. Can you explain the reason for these?

Is there any rational explanation of water divining?

Why is it that a male voice breaks, and a female one doesn't?

Why are people disagreeable at breakfast time?

Why is it that musical notation is the same the world over, and is the only universal written language?

Why do men's clothes button left over right, and women's right over left, and men wear the bow of their hat ribbon on the left, and women on the right?

How or why did Manx cats lose their tails?

About 20 years ago, we could always count on about 6 weeks' skating in England. Why can't we now? Has it anything to do with wireless waves and/or aerial activities?

Why will a needle, suspended from a thread and held close to the hand, swing up and down in straight lines for a man, and in circular motion over a woman's hand?

Why are there 364 days in a year, counting by the number of weeks, and 365 days when the months are added together ?

Why, the higher you get, the colder you get, and yet you are getting nearer the sun ?

Is it true that after having a good lunch, you weigh no more than before ?

Why can certain insects—bees, wasps, flies, etc.—fly at 20 or 30 miles per hour into a window without suffering injury or losing balance ? Can this theory be applied to aircraft or motor cars ?

When the figures on a clock or watch are in Roman Numerals, why is an exception made in the case of the figure 'four' ?

What is the basis of a happy marriage ?

Why is it that, in the majority of cases, one can easily distinguish a woman's handwriting from a man's ?

From whence does a flower—a rose for instance—draw its scent, and why have separate flowers distinctive scents ?

What is the invention which has brought the greatest benefit to mankind ?

Can you tell me whether fishes sleep ?

Why do not females grow beards ?

What is the fourth dimension ?

How many languages are spoken by the peoples of the U.S.S.R. ?

Why "Corned Beef" ? Should it not be "Canned Beef" ?

Why is the period immediately after marriage known as "Honeymoon" ?

What is Electricity ?

Why has every County its own brogue, and how did it originate ?

Does a man (blindfolded or in a thick fog), in attempting to walk in a straight line, always bear to the right and complete a circle ? If true, what is the reason ?

Why is character so often reflected in facial features ?

What has become of the Lost Tribes of Israel ?

Why are the British Isles referred to as "The Motherland" and Germany as "The Fatherland" ?

Fat people are usually full of good humour. Does fat beget good humour or good humour beget fat ?

Why do birds sing ?

How did man first discover and make perfect the screw, as used on bolts, and all pieces of machinery in connection with nuts ?

Why are there so many "Macs" in Scotland ?

Why is it that when motoring in fog, the visibility through the windscreen is governed by the density of the fog, while through the driving mirror reflecting through the rear window, the fog effect is considerably lessened and visibility considerably increased ?

Will the Brains Trust formulate and publish for the guidance of the people, say fifteen to twenty principles of sound living and thinking ?

Why do Chinese and Japanese have such narrow eyes ?

Why, in English, do we have words with different meanings, for example, we say : It's a fine day ; that's a fine thread ; a fine is imposed ?

Is it possible to have heat without light, or light without heat ?

To whom do our bodies belong ? If they belong to us, why does the law interfere if we want to do harm to ourselves ? If they are "loaned" to us, why again does the law interfere ? After all, the law will allow anybody to drink himself to death.

How does the steam make the pistons work on a train ?

Are dogs colour-blind ?

What is confidence ? Where does it come from—the head or the heart ?

Are ants a higher form of species than human beings, and would they be our masters if they were our size ?

Is it true that physical pain is purely imaginary ?

Why does water in a bath always run anti-clockwise ?

What effect has the Cinema on the life and thought of a nation ? Good or ill ?

What exactly is a "caul" at a baby's birth ? How rare is it ? What connection has it with the superstition that sailors never drown when carrying one ?

Why don't tiddlers come out of water-taps ?

Why has nature ordained that a crab should walk sideways ?

Can you explain the eclipse of the sun and moon ? How do people tell when this is going to happen ? What causes this—the movement of the earth or weather conditions ?

Is an egg liquid or solid ?

What organ in the domestic cat produces the purr, and where is it situated ?

Why were sailors called "Jack Tar" ?

In an organised community, in order of importance, which are the most essential professions or occupations ?

How do you consider modern youth compares with early twentieth century youth as regards enthusiasm for work and efficiency in it ?

THE MOST ASKED QUESTION OF ALL—

Which came first, the chicken or the egg ?

SECTION THREE

"MANY QUESTIONS"

A complete session of the Brains Trust, exactly as broadcast on Sunday, October 5th, 1941, with Miss Ellen Wilkinson, M.P., and Dr. Malcolm Sargent as guests.

Donald McCullough: This week the Brains Trust is putting a very crafty side into the field. They are all "old hands," and very swift ones, too. Miss Ellen Wilkinson you all know. She is a highly concentrated political pressure group that doesn't care a hoot for producers or question masters or even Professor Joad. Commander Campbell saw it happen in Patagonia. Dr. Julian Huxley knows that it is simply a matter of reflex action. Professor Joad disagrees profoundly, and Dr. Malcolm Sargent has acquired the musical comedy rights for the show.

That is the Brains Trust—here are the questions.

The first comes from Mr. Noake, of London, N.W.2, and he asks: "What is superstition?" Joad?

C. E. M. Joad: There is quite a famous definition. Samuel Butler. "Superstition is the power of believing in things which are not true." Samuel Butler then goes on to identify superstition with faith. Being mischievous, he says faith, or superstition, is a power of believing in things which are not true. The point about it is that it's a very subjective definition. I mean it is very much in the mind of the person who makes the definition, because nobody who is superstitious really believes that what he is believing is not true. You cannot—as a matter of psychological fact—believe something which you at the same time believe not to be true. Therefore, a person who believes in a superstition believes that *what* he believes is, in fact, true. Therefore,

what is *his* superstition to everybody else is *not* superstition to him. And, therefore, you cannot really give a definition of superstition without giving also a definition of truth, which at this moment I don't propose to give.

Donald

McCullough: Well, that's big of you! Sargent?

Malcolm I'm not at all qualified to answer this

Sargent: question; but with regard to "truth,"

I think that at a session some time ago we decided that it was "perfection thought." Well, if truth is "perfection thought," then I would say that the difference between superstition and faith (and I think it is very important to draw a distinction, they *are* very different) is this—superstition seems to me to be that you are afraid that the thing *might* be true. You don't really feel it is, but you are afraid it might be. Now in "faith," you feel that it *is*, but you cannot prove it. That is to say, you cannot logically prove it with your mind or to the satisfaction of anybody else's mind, but in your heart of hearts you feel the thing is true. That is faith. Superstition is quite the reverse. It means that you feel that it probably is not, but it "might be," and you are rather afraid that if it *is* true, then you are in the cart unless you do something particular or peculiar! If I go under the ladder it may be true this is bad luck, so perhaps it is better for me not to go under the ladder. Superstition and faith, I would say, are absolutely the opposite one from the other.

Ellen I think there is a pathetic, practical side

Wilkinson: to that. There are so many people who never find out about the world and why things happen in the world, and so they comfort themselves with all sorts of dodges until life becomes almost impossible. They believe in things like going under a ladder, or casting salt over the left shoulder, because they don't know. You ask, What is superstition? I think the cure for superstition is finding out how things happen.

Julian S. I agree with Sargent that very often,

Huxley: especially in modern times, superstition is being afraid of something, rather fearing it might be true and not taking any chances. On the other hand, I wish I could agree that it was always the diametrical opposite of faith. There have been numerous

cases of articles of faith which have turned out to be superstitions. Not to go into any religious controversy, there are all sorts of primitive practices of savages which they believe in very genuinely, which to us are purely superstitious practices. But in the modern world, superstition, I do agree with you, is largely the outcome of fear and of ignorance. Personally, I rather agree with the man who was asked whether he had any superstitions. He said he only had one which he held very strongly. He absolutely refused to sleep thirteen in a bed.

Commander Campbell: Isn't there some association of ideas in the superstitions theory? How many people to-day, if they recount a certain event, if it is a dreaded one, they say, "Oh, touch wood!" This is based on the fact that in the early days pieces of the Cross were carried round as relics and people believed that there was some virtue in touching them. The same with walking under a ladder. You stand a much greater chance of having a pot of paint drop on your head if you go under it than if you went round it. Like all sailors, I am extremely superstitious and I never like sailing on a Friday. For the simple reason you may miss another happy weekend! I'd rather have sailed on a Monday.

C. E. M. Joad: I would like to bring us back to the point at which we started, or rather at which I started, and everybody has quite unaccountably ignored, and that is the point about the subjectivity of superstition. This is what I mean. In the Middle Ages, most people believed, indeed it was an article of faith, that a certain number of angels could dance on the point of a pin, and the great question was as to how many there should be. That was faith in the Middle Ages. To us it is a superstition. Therefore what is faith at one time is superstition at another, and in that sense is purely relative. How can we distinguish between them? I suggest this definition. That you call it faith, not because you can verify it, but because it fits into the generally accepted body of knowledge at the time. The view that angels dance on the point of a pin does not fit into the accepted body of knowledge about the universe in the twentieth century, although it did in the 13th.

Julian S. Huxley: An excellent point, but it surely disposes of the contention that superstition is entirely subjective. Because Joad

has just said it is what fits in, or doesn't fit in, with the body of knowledge at the time. So there is an objective criterion. The body of educated opinion and facts which have been recovered show that certain things which we once thought were articles of faith are now superstitions. Like astrology.

Donald Well I think that's as far as we can go
McCullough: for the moment. I hope the answer will help some folk to stop making themselves miserable.

The next question. We get a great many letters asking the Brains Trust to discuss the rights and wrongs of a National Sweepstake to raise war funds. Here is a version from Mr. T. Siddle, of Cardiff. **"If asked to form itself into a Government Committee, what, roughly, would be the report of the Brains Trust on the advisability of reviving Government lotteries in this country?"** Campbell?

Commander I think it would be a very good idea.
A. B. Campbell: In most British people is a desire to make money easily, and betting seems one way. You've only got to walk round the poorer parts of London in peace-time and you'll see women at the street doors putting their sixpences on with the milkman. Wasn't that the basis of our first insurance schemes? Insurance as we know it to-day sprang from the early days of the lotteries. I have a scheme in mind whereby we could also encourage thrift as well as make money by lotteries.

Donald
McCullough: Huxley?

Julian S. There is a great deal to be said on the
Huxley: other side. I lived ten months in Naples once, where in Italy you have these lotteries—state lotteries—developed to an enormous extent. There, actually, the average citizen just lived for the next drawing of the lottery. As a result, there was an enormous squandering of money and thought and everything else on these lotteries. It undoubtedly was, on balance, a bad thing for thrift and for public morale.

Ellen I agree with Huxley that it is a
Wilkinson: thoroughly bad thing for the Government to have anything to do with these state lotteries. Whatever funds are needed must

be raised by the citizens from taxation, and by that they learn what they want and how best money should be expended into control over public expenditure. But to give the idea that lotteries can be respectable brings in that myth which cuts at the basis of all really civilised life, that you can get things without working, and you can get them as the result of a gamble or a racket.

Malcolm I would say that it rather becomes a
Sargent: moral point. It's so easy to say that it is right or wrong to gamble. "If it is wrong, then the Government should suppress it. If it is right, then the Government should allow it to be run by a Government Department for the benefit of the state." But, obviously, that is not really a true thing to say; because the Government will not take upon itself to decide upon all points whether a thing is "right" or "wrong." Therefore, it is correct for a Government to say: "This thing exists; we are not certain whether we ought to suppress it, but we can be certain that we should not definitely *support* it by making it part of our job."

Julian S. But it does suppress it. Lotteries are
Huxley: illegal in this country. Even private ones.

Ellen Even bazaar raffles really are of very
Wilkinson: doubtful legality.

Donald Well it's interesting, but of course it is
McCullough: really hopelessly academic. In this country the prizewinners would never get their money out of the Treasury.

So I think we might now go on to the next question which comes from Gunner Alice Morrison, one of the A.T.S. girls with an Ack-Ack unit. She sends this question. "It may be very elementary to you, but when a composer writes a symphony, does he visualise the mass effect or does he write the piano part and have it orchestrated? Some of the great music sounds inspired to me and I can't believe that the composer worked out the parts for the violins, the flute, the oboe, and was able to know exactly how they would sound when they were played together." I think, Sargent, this is absolutely and entirely "you."

Malcolm

Yes. I must say quite definitely that all

Sargent: good composers have heard the thing in their mind exactly as you hear it,

probably even better than you hear it at an actual performance. And you must not think that because it is difficult for *you* to understand a person being able mentally to visualise or hear fiddles, flutes, oboes and so on, that therefore it is not possible. I can assure you that any conductor worth his salt studies his score in private and from it he hears exactly the results achieved, and as the composer intends it, and that he spends his time at rehearsal seeing that that effect, which he has already imagined, actually comes to pass. He finds really, in performance at the first rehearsal, that the sound is not as good! Most amateurs of music probably think the sound of the orchestra is so much better than anyone could imagine. Now I assure you that to the conductor or any musician who knows his job and can really hear through his eyes, the sound at the first rehearsal is a great disappointment from the actual mental conception he has had in his own study. He sets to work to make sure that the thing is clarified in performance so that he can really get the sound over as he believes the composer intended it. The composer *does* score it straight away. He may write a little sketch, as you might sketch out a plot of a play, and then set to work to write the dialogue, but the actual scoring is part of the composer's job and he would not leave it to anybody else at all. Not if he is a first-class musician.

Donald

McCullough: Grand! Huxley?

Julian S. But I think the point was, does the

Huxley: composer from the beginning think in complete orchestral terms or does he

sometimes think in terms of a tune, as it were, a melody which he sketches out for the piano or for the flute, and then fills that in? And what I wanted to ask Sargent was, just as writers differ in the way they write poetry (some write a line at a time and then polish very carefully, and others rely on thinking the whole thing out and having it out in a flash) might not one composer work one way and another with a different method?

C. E. M. Joad: Before Sargent answers, may I put that general question in a specific form? I have always been taught that there is a

great difference between, let us say, Mozart's and Beethoven's method of composition. Mozart visualised the whole thing in his mind and then wrote it straight out. Beethoven visualised it in bits, wrote down the bits, tried them out on the piano and if he was pleased with them, orchestrated them afterwards. I believe that is historically a fact. If so, isn't that the answer to the question that there is no universal royal road?

Malcolm

Well, of course you must remember that composition of a large thing like a symphony is like the painting of a big picture, it doesn't take place in a flash. A man makes sketches of what he is going to paint, and then it may take him six months actually to apply the paint. But he has a conception in his mind which is already complete. Not complete in actual square inches of canvas but complete as a vision. Then he sets to work and the vision becomes made manifest to him as he works. The same thing applies with a musical composition. Mozart was able (he had an extraordinary mind, as we know from the way he could memorise complete compositions which he had heard, and then write them down), Mozart was able to carry it in his mind as a whole composition. He didn't conceive it in a moment, in a flash, in his mind. He, obviously, as Beethoven did, conceived the first few bars probably, and from that the thing developed. Beethoven used to wander in the fields and find a tune, which was really an emotion which was expressed in a certain shape. Then he might go home and try it on the piano if he liked. I do not believe for one second that he needed the piano in order to try it. But he then reshaped it, and he would reshape it and reshape it. But all the time the feeling of the composition was there. He knew what he was going to do. He knew the sort of symphony he was going to write. You cannot explain music in words, therefore probably this is very inadequate, but the point of the question I think was, whether the composer conceives it as a piano piece and then orchestrates it. I can assure you that the answer to that is, he does *not* conceive it as a piano piece. He conceives it as music. He may conceive it as an orchestral piece or he may at leisure add to the orchestration, but the orchestration as you hear it is part of the composition and is made by the composer himself.

Donald We could listen to this man on music
McCullough : for hours, but we must get on.

The next question is from Mr. Ernest Pullom, of Leeds : "Would you suggest that some test should be undergone by every prospective Member of Parliament or Councillor ? If so, what test or tests would you institute ?" Miss Wilkinson ?

Ellen Well, honestly, I should say Members of
Wilkinson : Parliament sometimes . . . well . . .
I do think it would have been a good idea if we could have had an elementary intelligence test. But the difficulty is (I say this to Professor Joad, and I may be slaughtered in Parliament when it next meets) the people I find would fail in that general intelligence test are nearly always the Professors. Some of the people who really seem to understand best the true spirit of Parliament and what it means in our national life are miners and carpenters and the people who have had experience in the work of local authorities and live very closely to the hard realities of life. With regard to Councillors, I do think there that commonsense and a knowledge of how ordinary folk live is the one big thing that people want. But where some of the people in Parliament get their knowledge of how ordinary folk live has always been one of my puzzles.

Donald Do you think that some kind of a test
McCullough : would be a good idea, Miss Wilkinson ?

Ellen Well, do you think you could find 615
Wilkinson : people to pass any sort of worthwhile general test ? I often wonder. An examination ? No ! Because the great thing about Parliament is that it is a cross-section of the population, and people's experience and commonsense is what we want, rather than a great deal in the way of accurate knowledge. (Now Joad will sit on me !)

Donald I am sure Professor Joad on this question
McCullough : of a test will be worth hearing.

C. E. M. Joad : If I can come the Professor over Miss Wilkinson for a moment, I would like to tell her that all this is exhaustively discussed in Plato, and there the question is asked. This is the sort of way it comes up. If you want to build a ship, if you want to build a city, you go to an expert and find out how it ought to be done. If you want to govern a country,

instead of getting a Government of experts, you allow any old Tom, Dick or Harry or Mary or Ellen to get into Parliament and do it for you. Now surely governing a country is more important than building a ship? That is the line Plato takes. His solution is fairly well known. It is that, that being so, the people who ought to govern a country are philosophers. He says until philosophers are kings, mankind will never come by salvation. Now, I don't agree with Plato, and surprisingly, I do agree with Miss Wilkinson. The difficulty is (1) how to determine who your philosopher is, (2) how to get people to obey him, even if you have appointed him. Being myself a democrat, I think it is essential that people should be allowed to select to represent them whoever they like. If they select incompetent people to represent them, then it is on the heads of the electors, and I think the whole principle of democracy here is that people should be allowed to make their own mistakes in choosing incompetent persons, and that they should pay for the mistakes by being misgoverned. I think the reason for that is that it is impossible to devise a suitable test, and it is impossible, I think, to determine who should be allowed to devise a test. I should devise a test for philosophers, Huxley for scientists. Miss Wilkinson, I think, should devise a test for orators, being a great speaker. But you see, we all devise different sorts of tests. There is nobody to devise a test to determine who shall be allowed to devise the tests. That being so, I think the only real answer to the question is—no test, and let it be on the heads of the people to elect the right people.

Malcolm

I think the Professor has led up to the point that I wished to make. It seems to me the test is there, if only it were carried out properly. The test is the General Election. At the ordinary electioneering meeting a little more sense should be talked and a little less tub-thumping. The party and the politics which have always come into the meeting should go by the board. People should really ask intelligent questions of the various candidates. I wouldn't mind if half-a-dozen candidates were put up. The best man at answering the questions, the man who showed what Miss Wilkinson wants, that he knew most of the ordinary working life of the people and therefore could best represent them; the man who also showed that he could speak in public, in fact the man who could show on the platform

that he had the necessary qualities for the Parliamentarian, then the Election would be "the test," and the best man at each election who passed it would be the best representative of the people to be put up for Parliament.

Julian S. But surely the trouble with what Joad
Huxley: and Sargent have just said is that actually the people, as such, so often get little choice. They don't have the choice of representatives. They can choose between one man who has been put up by the Conservative party caucus and another man who has been put up by the Labour party caucus, and there is not any free choice in the matter. That is just a modern development of politics which is very unfortunate. But over the question of tests, wouldn't it be a good thing if we gradually developed, not so much the idea of a test in the form of an examination or an intelligence test, but some requirements, some, as it were, professional requirements, that the man would have had to have a certain amount of experience and a certain amount of training in a Government Staff College, or whatever it might be?

Donald I am sure we are very grateful. I am
McCullough: also sure the producers of the Brains Trust programme would be happy to run through any M.P.s or prospective M.P.s to see how they spark here.

The next question comes from a small boy. The other week we had the whole country doing fly-watching; and now we are going to have a look at cats. The question comes from J. R. Evans, of Llanfallreg, Carmarthenshire, or something like that. At any rate, it is certainly in Carmarthenshire. **"How is it that the cat, and only the cat, always lands on its feet irrespective of the height or position from which it drops?"**

Julian S. The answer is that it isn't only the cat.

Huxley: The cat has this postural reflex, as the physiologists call it, which is more highly developed in the cat family than most other animals. It is a purely automatic thing which is a most complicated nervous mechanism, set into action by the fact of the cat being in an abnormal position, upside down or whatever it might be. This immediately sets going certain nerve paths in the spinal cord and brain which right the animal. I have forgotten the distance (it is about two feet six inches,

I think) that it takes to right itself if dropped. But lots of other animals have similar reflexes. One of the most interesting ones is the reflex of a duck. When its head is held down in a certain position, it automatically ceases breathing because normally this is advantageous for it, owing to its beak being under water.

Donald As far as I can see, what the world
McCullough: wants is less brain and more reflexes.
But now for "Second Thoughts". An
opportunity for one member of the Brains Trust to explain away the past, the present, or the future. To-day I call on Commander Campbell.

Commander About three sessions ago a question was
A. B. Campbell: asked concerning tidal waves and I answered it, but I find that I omitted a rather important point. That was, the tidal wave has nothing whatever to do with tides. People have written to me and said: "What have the tides got to do with it?" The tidal wave would, I think, be more correctly called an earthquake wave, because some of the biggest tidal waves have been caused by earthquakes. I remember when I was at Callas I travelled up the road to Lima. Twelve miles up that road there is a shrine which marks the limit where a tidal wave swept up and engulfed a city completely, drowned many thousand people, and then gradually receded. Well, that was a tidal wave, but the better term is earthquake wave.

Why is it that we have these bores up the rivers? The bore is due to the tides (that is not a tidal wave) and it occurs at the new and the full moon because at that time the moon and the sun, which are responsible for the tides, pull together. So we get a low and a high tide, a higher tide than usual and a lower tide than usual. When the sun and moon are at right angles, which is called in apposition, we get what we call the Neap tides. That's just the same word as "nipped"—they are very much shorter. And when the high tides are up and they come into an estuary like the Severn, the water gets bunched up and forms a very high wave. This is called a "bore." So you see, tidal waves have nothing whatever to do with the tides.

Then one more point, we had a question about dreams, and did dreams come true. I was reminded of a dream that did come true in my case and it happened in rather strange circumstances. I'd like to tell you the story.

Once I came back from Australia and I was walking down the Strand when I ran into a friend. He said: "Hallo, old man, are you going to the Derby on Wednesday?" I said I had no idea it was on. Did he know anything? He said, "No, I don't know anything about horses at all, but I dreamt last night that a grey horse won." "Oh," I said, "is there one in the race?" "I don't know," said he, "but it's all nonsense because when the jockey dismounted, he was talking in French." "Oh, well," I said, "you must have been dreaming about the Grand Prix."

Anyhow, that afternoon in the club I mentioned this fact and to my great astonishment everybody there said: "But you know who is riding, don't you? A fellow named Stern—he's been riding in France for the last three years. He speaks French like a native." "Is there a grey horse in the race?" I asked. "No, there isn't." "Well," I said, "that's killed it." "Oh no, there's a grey mare," someone said.

To make a long story short, I went down to the Derby that day and as this man described it to me, round Tattenham Corner they came, the grey mare in front. Another horse was about five lengths behind, and the rest of the crowd were all bunched up round the Corner. It was very remarkable. I had told many people and I am glad to say some of them benefited by it, but the curious circumstance of this chap hearing the jockey speak French has always struck me as being rather strange. Next year I happened to be in England at Derby time, and I took my dreamer friend to a well-known restaurant. I fed him on lobster, salmon and crab, then sent him home, hoping he would have another dream. He told me the next day he'd gone through the most dreadful nightmare he'd ever had in his life.

Donald Dreaming, my dearest love, of thee!
McCullough: Huxley, you want to make a comment?

Julian S. There is just one point apropos of tidal
Huxley: waves, so-called. Here I seem to have
 the advantage over Campbell for once,
because I was living in Houston, Texas, when Galveston Bay was struck by the second so-called big tidal wave. In that case it was not an earthquake wave, it was a storm wave. It was a south wind which blew the very shallow waters of the Gulf of Mexico far inland and actually

steamers of over a thousand tons were dropped a mile inland and more.

Commander Quite, but that was not the tide. It
A. B. Campbell : was the wind.

Donald Well, I'm surprised at Dr. Huxley
McCullough : muscling in on Campbell's department like that, but it's most interesting, and his story about big steamers sluicing about the countryside should get Campbell right on his toes. I congratulate the gallant Commander on an extremely interesting contribution.

Now a question from Miss Edna Davies, of Little Chalfont. She says, **would the Brains Trust help her form a library by recommending a book every week on some useful subject.** At that rate, numerically, it would take about two years for the Brains Trust to list all the books they have written. So we'll pass on the honour to our guests, and ask one of them to recommend a book. As we have been listening with such pleasure to Dr. Sargent, I think it would be interesting if he would recommend a book on music. Have you any nice books on music, Dr. Sargent ?

Malcolm If you want a book on music, I think
Sargent : probably the best one you can get hold of at the moment is the *Oxford Companion to Music*, by Percy Scholes, which has been produced quite lately by the Oxford University Press, and is an extremely good book. It has all sorts of things in it that most dictionaries have not, and it is very concise. It is full of information and very accurate indeed. I think if you just want a book on music, that is the one I would plump for straight away.

Donald Right, we'll plump. Miss Wilkinson,
McCullough : have you any books you think the nation ought to read ?

Ellen The book which I am reading at the
Wilkinson : moment and which is the most interesting thing I have read for a long time is *The Modern Mind*, by Michael Roberts. But that has nothing to do with politics at all.

I have a suggestion on music, and I believe I am a better person than Sargent, because I am a layman, and therefore when I talk about music I do it from the layman's point of view. The fascinating book that I read on music when I first got passionately interested in it was called *A Musical Pilgrim's Progress*, by J. B. M. Rorke, published by the Oxford University Press. It is an account of how he came to like different kinds of music, passing from one composer to another; his reactions; how each stage developed; how it came to be the most important thing in his life. It's a fascinating book.

Donald McCullough: That's books settled for the afternoon. The next question, from Alex Hawthorne, of London, W.10, asks: "What, in your opinion, is the value of tuition by correspondence. Can it be as effective as oral tuition?" Miss Wilkinson?

Ellen Wilkinson: Correspondence is good for just actual practical things, like "How to Mend the Tap," or "How to Speak Good English." But I do think the personality of the teacher counts such a lot in any kind of education that it is a pity if people take correspondence courses when there is any chance whatever of getting a good teacher.

Julian S. Huxley: Yes. Isn't it a fact that what you cannot get in a correspondence course is the give-and-take between teacher and pupil? At the University stage, which is where I know something about education, it is absolutely important to have this actual discussion going on. That is what elicits things.

Of course Huxley is absolutely right. C. E. M. Joad: What really matters in any subject which it is worth teaching to adults is not so much pouring facts into their heads like jam into a jar, but discussing with them. The ideal form of education is a little lecture perhaps by the teacher, and then discussion of it afterwards with questions asked by the students. That give and take, that discussion between minds, which is the essence of adult education in any subject worth having, such as science or philosophy, is the one thing you cannot do by correspondence.

Malcolm From the point of view of any musical
Sargent: tuition by correspondence, I don't want to run down the people who do correspondence courses. They are excellent if you can get nothing better. But, honestly, if you learn to play the piano by correspondence, the teacher can never hear you play the piano and can correct no faults of yours at all. If, ideally, you do exactly what you are told, you probably might become a good pianist. But as no one ever does do exactly what they are told in such a very subtle thing as playing the piano, then, I can say, learn by correspondence if you have no better means of learning, but almost I would rather have an indifferent personal teacher than the best correspondence course.

Commander I am rather amazed to find that one
A. B. Campbell: can learn boxing by correspondence. It seems to me a much easier way to gain fistic prowess.

Donald It seems practically perfect for small
McCullough: chaps.

The next question may easily cause a panic in the Brains Trust, or something. Many of our women listeners have been writing to ask about their clothes. Mrs. Hagedorn, of West Hampstead, says: **"Since the blackout I have always disrobed in the dark. Why does my artificial silk underwear give off sparks?"** If you will all try to keep calm, gentlemen, please! Professor Joad, I am afraid, has lost control. Mrs. McClelland, of Nottingham, is another of the many women who has noticed this, and she points out too that her hair when combed and brushed crackles and gives off sparks. Mrs. McClelland wants to know whether this personal electrification is a good thing or not. Huxley?

Julian S. It just doesn't matter! It is not a good
Huxley: thing or a bad thing. It is repeating with these particular materials, in one case the comb (presumably celluloid) and human hair, and in another case human hair and silk (artificial or otherwise, or even wool will do it), the old experiments that were done in the eighteenth century on electrification. You rub certain things with certain other things and one gets charged negatively and the other gets charged positively. You can get sparks out of a cat by rubbing it with flannel. It isn't a good thing or a bad thing.

Donald McCullough : That's the best we can do by correspondence.

The next question comes from Mr. Spankie, of Ilford. He says: "**A philosopher of the pre-Joad era stated that there was nothing new under the sun. Does the Brains Trust consider that this statement holds good at the present time ?**" Huxley ?

Julian S. Huxley : No, it never has held true. There is always something new under the sun. Even before man ever appeared on the earth the earth changed and there were new things. The appearance of new things has increased the rapidity of the rate at which they increase and appear to have increased since civilisation began.

C. E. M. Joad : I'd like to make a distinction, if I may. In the seventeenth century Newton's Law of Gravitation was held to be absolutely true. In the twentieth century, first a special and then a general theory of relativity by Einstein was substituted for it. Well now, the general theory of relativity is new ; in that sense there is something new under the sun. The facts to which the general theory of relativity applies are not new. They have always been the same. In that sense I think the laws which the physical universe gave have always been the same. In that sense, there is nothing new under the sun. But there is one more sense I would like to mention. We know about evolution. We know, as Huxley has just been pointing out, that new forms of life constantly appear. Now, certain thinkers have held (I believe they are right) that the universe itself is evolving in that sense, the philosophy of creative evolution put forward by Henri Bergson, the great French philosopher. The point about emergent evolution is that new qualities are continually being evolved in the universe as a whole. For example, atoms are associated and make elements. The qualities of elements are not those of atoms. Elements are associated and make molecules. The qualities of molecules are not those of elements. Molecules are associated and make crystals ; the qualities of crystals are not those of molecules. Crystals are associated and you get life, and the quality of life is not that of matter. Now in that sense life may be a new quality which is thrown up in the Universe as it evolves. It is not so much a case of saying there is nothing new under the sun—everything under the sun in that sense

is always new, because the Universe is a creative Universe.

Julian S. You get new types of music, new
Huxley : individual compositions, new forms of
civilisation. I entirely agree with Joad,
whatever the theory of the Universe you hold, that it is a
fact that new things and new combinations appear in the
course of history and evolution.

Ellen What about things like plastics? That
Wilkinson : is something they have just invented.
They are really new, even though the
actual elements they are composed of have always been
on the earth.

Julian S. A great many of them are entirely new.
Huxley : Of course, sealing-wax is a very old
form of plastic; but a great many
things they have invented—these transparent ones—are
entirely new.

C. E. M. Joad : This is a most complicated question, and
there is something essential which I
ought to have put in and which I did not.
I have been talking about a creative and novelty-making
Universe. I think one ought to add it may be the case that
not the whole of the Universe is evolving. There may be
in it certain elements which are permanent, static and
eternal. God, for example, or beauty, or truth. I should
say that here is a Universe which contains certain perfect,
permanent and immutable factors and also an evolving
factor which is life, and life is continually evolving and
developing greater knowledge of those things in the
Universe which are permanent and perfect.

Donald Thank you very much. There you are,
McCullough : Mr. Spankie; you asked whether there
is anything new under the sun, and the
answer seems to be in a way "Yes," and in a way "No,"
but generally vice versa.

These questions are getting very disturbing to-day.
One of the hardest worked words in our language is "love."
Now, to-day, in response to many requests in dainty
handwriting, I put forward the question, "Is love
spiritual or physical?" Huxley?

Julian S. The answer, surely, like all questions
Huxley : of that type is—neither, but both.

Donald The answer is neither but both. The
McCullough : next question comes from . . .

C. E. M. Joad : I tried to answer this months ago at
immense length. It's funny it should be
asked again. I thought I had settled the
question once and for all.

Donald Yes, Joad fixed up love months ago,
McCullough : and Huxley has now settled it finally.
The answer is neither, but both.

Mr. S. A. Sweetman, of Exeter, is concerned about the advance in the status of women, economically, politically, and in the home. He asks: **"Does this constitute a menace to the nation in that it has resulted in a growing disinclination to have a family and a consequent reduction of the man-power essential to national defence."** Miss Wilkinson?

Ellen Surely the question of whether the
Wilkinson : emancipation of women has caused a
reduction in families doesn't in itself
mean that the race is going down, but that the women who are intelligent and who care for their children properly and who are interested in them produce a better type. There is less of a damage rate—fewer children die. Theirs is not the happy state of the woman who has buried nine and thought she was, therefore, a good mother. Anything that makes women interested, intelligent and alive helps to make the family a more interesting and therefore a more worth while unit for the State, and (I quote Joad) the biologic urge will take care of the rest.

Just on the point of fact, I have been
C. E. M. Joad : reading recently a book on population
by Carl Saunders and there are three
reasons given for the great decline in the birth-rate. (Incidentally, I happen to remember the figures. It was 32 per thousand in the Victorian age, about 1880. It is now just under 16 per thousand; rather less than half.) One of them is the knowledge of birth control. A second is the schooling of children, which means that the child is a liability and not an asset to the family wage-earning. A third is the employment of women and with it the raising of the marriageable age. There is also the demand on the part of women for life at a higher level

than is consistent with continued child-bearing. I very much disagree with the implication in the last part of the question that a declining population is necessarily a bad thing. At the moment, naturally, we think only about national defence, but surely what seems to me to matter is that there should be few people with high quality life, not many people with low quality life.

Julian S. But there is a quantitative as well as a
Huxley : qualitative side to the question. It is not, I am afraid, altogether true that if you give more people an interesting time they necessarily get interested in having bigger families. That, as a fact, has been largely untrue. It is mainly in the upper middle class (where they have more opportunities, the baby-car competing with the baby) where families have decreased most. However well spaced, you must have an average of rather more than three children per family, if you want to replace the nation. Do you want increase, do you want stability, or do you want decrease? Whatever you want, I don't think you want a catastrophic fall. At the moment unless something happens, we shall be in for a rather catastrophic fall in about twenty-five years' time. But whether that has anything to do with the emancipation of women, which is the question, is another matter. I don't think it is by any means correlated only with the women. There are other reasons, like the general state of society, the father's earning capacity, and so on.

Ellen But surely the emancipation of women
Wilkinson : does come into that. You don't get a falling birth-rate where you have women who are not allowed to have any other interests but to stay at home and look after their children.

Donald Well, thank you very much indeed. I'm
McCullough : afraid the poor Brains Trust is a bit exhausted after handling all this feminine dynamite to-day, so next week I hope we shall get safely back into the clouds.

COMMUNICATION WITH MARS

Capt. J. W. Hunt, of Stranraer, asks : "Does the Brains Trust consider that it is possible for communication to be established between the earth and other planets?"

Julian S. It would first of all depend upon whether
Huxley : there was anything on the other planets
to communicate with. The general consensus of opinion now is that there cannot be, or at any rate, nothing of the same nature as our life. There was at one time a suggestion that there might be life on Mars. They think that is still just possible, but I gather from recent astronomical discoveries that it is very unlikely. The temperatures and so on are so different that it is most improbable.

THE REVOLVING EARTH

Mr. Glass, of Glamorgan, asks : "What is the motive power that causes the earth to revolve once every twenty-four hours ?"

Julian S. Surely the reason is that the mass of
Huxley : matter which condensed to form the earth was rotating when first isolated, and the rotation could not help going on. There's no friction, you see, in open space, so the movement simply continues. The current theory is that another star approached near enough to the original sun to attract great streamers of gaseous matter out from it. These streamers or arms later condensed to form the planets.

The speed of the earth's rotation is being gradually slowed down owing to the friction of the tides, which means that the day is getting slightly longer all the time. If you could harness the tides, you'd increase the friction and speed up the process of day-lengthening. Many millions of years hence, the earth will have been slowed down until it always presents the same face to the sun, as has already happened with the moon *vis-à-vis* the earth.

SHOOTING STARS

Miss Joyce Taylor, in the St. John Ambulance Association, asks : "What exactly is a shooting star ?"

Julian S. A shooting star is a fragment of material
Huxley : which comes from outer empty space and enters our atmosphere. Then it is going so fast that it burns itself up with an incandescence which you see as a shooting star. If it does not burn itself

up entirely and falls on the earth, we call it a meteorite. There are meteorites up to many tons in weight.

C. E. M. Joad: The atmosphere makes it burn?

Julian S. Yes. Once it gets where there is any

Huxley: oxygen; otherwise it cannot burn.

THUNDERBOLTS

The next question comes from dozens of listeners—it may be due to the new appointment to the Ministry of Information—it may be the weather. The question is: "What is a thunderbolt?"

Julian S. A thunderbolt is a legendary interpreta-

Huxley: tion of the fact that after you hear thunder the lightning may strike. What actually does the damage is not the thunder, it is the lightning. But it used to be supposed that actual bolts, some solid object, fell to earth and produced the damage, I remember when I was a boy seeing sold on the top of Beachy Head, near Eastbourne, "Thunderbolts from the cliffs, one shilling each!" What they were selling were masses of iron pyrites. A very easy way of making money—but not quite scientific.

Donald

McCullough: Campbell, were you ever hit by one?

Commander No. I've never been hit by one, but, I
A. B. Campbell: wonder, aren't those meteorites also mistaken sometimes for thunderbolts?

Julian S. Oh, yes, meteorites are, and also the

Huxley: belemnites—those fossils of cuttle-fish that look like fossil cigars. Devil's cigars, they call them in America. Thunderbolts they call them over here.

NORTHERN LIGHTS

Roy Farrell, of Biggleswade, wants to know what is the cause of the phenomenon known as Northern Lights? Is it confined to the North, and is it related to the Midnight Sun?"

Julian S. No, it is not confined to the North.
Huxley: It is a Polar phenomenon, and I don't think it has anything to do with the sun. It can happen in the Arctic nights just as well as in the day, and it is an electrical phenomenon. It is like an electrical discharge in one of those vacuum tubes, producing these coloured lights through ionisation.

Commander Yes, and the strange thing is (I don't
A. B. Campbell: know the scientific reason), in the Antarctic the colours are reds and yellows as against the violets and blues of the North. They call it the Aurora Australis down there. It's very, very beautiful indeed. It looks like huge fires burning, quite different from the Northern Lights. I have seen them both in the Arctic and Antarctic and they are indeed a beautiful sight.

MAGNETIC NORTH

A.R.P. Officer John Yates wants this answered for his Air Training Corps map-reading class. "Why does the compass needle point always to the magnetic North?"

Julian S. Because the earth functions as a magnet
Huxley: and it is the principle of the compass needle to orient itself in the magnetic field north and south. Well then, the earth is a magnet, but its magnetic poles are not identical with the north and south poles geographically. That is why it points to the magnetic north and not to the true north. Also, the trouble is that for reasons people don't understand, the magnetic north fluctuates so that the charts have to be revised every so often with regard to the deviation of the compass at any place from the true north.

Commander The variations are remarkable. The
A. B. Campbell: nautical almanack gives you the daily variations for each year, which you have to adjust. I have an idea this variation has to do with the density of the earth at the pole. I don't know whether that is so scientifically, but the earth, it seems, fluctuates in a fluid state and so detracts the needle this way or that. It varies very considerably in places.

GULF STREAM'S FORCE

Mr. Parsons, of Liverpool, would like to know what is the driving force of streams and of the ocean ; for example, the Gulf Stream ?

Commander I have always understood that it starts
A. B. Campbell : in the Gulf of Florida at a speed of about five knots, which is rather a high speed, and loses considerably crossing the Atlantic. It is practically only about half a mile strong when it reaches our shores. I don't know if that is scientifically so, but as a sailor I always understood that.

J. B. S. The force behind it is partly due to the
Haldane : prevailing wind and partly to temperature differences in the ocean, which cause the warmer water to rise in certain areas and the colder water to fall. This inevitably involves lateral movements which appear, on the surface, as currents, and you have therefore somewhat of a compromise between the effect of the wind and the effect of the temperature differences.

Julian S. Isn't there also an effect of the rotation
Huxley : of the earth ?

J. B. S. Undoubtedly that causes a current to
Haldane : deviate from what would otherwise be its direction, but I do not think myself that it could be regarded as a driving force.

BURIED ALIVE

A lady ambulance driver says : "Two or three years ago, in a circus performance, I saw an Indian woman bury herself alive for five full minutes. There was no faking in the act, she definitely was buried alive. How was this possible ?"

Commander Lord Roberts, in his *Forty Years in India*,
A. B. Campbell : tells the story of how a fakir was buried for thirty days. I understand that these fakirs first of all thoroughly purge themselves, and then fill the stomach with goat's milk. Then they close all the orifices with wax and go into a sort of cataleptic trance. They are

placed in a coffin and buried, and they stay there for, say, ten days, fifteen days. When they are brought up, the brother fakir puts his finger down and unrolls the tongue, which has been rolled back to close the throat, and just presses on the chest, like reviving from drowning. After three or four pressures, the air gets into the lungs again and the man revives. I know that happens in India.

C. E. M. Joad: Although five full minutes has been mentioned in the question, I agree with Campbell that it has happened for as much as thirty days. I have heard that it has happened even for longer. Campbell has given an explanation in purely physical terms. He has talked about catalepsy, and I mention that catalepsy means, among other things, suspension of the operations of the heart. I want to add this. If you are going to admit that there is a mind which (in a sense) can make itself distinct from and independent of the body, it can control the body in certain ways. For example, if I now will to create a roll of muscle on my arm by doing dumb-bell exercises in the morning, I can alter my body in that sense. Now it is claimed, and I think the claim can probably be sustained, that as a result of mental trainings and disciplines, which may or may not have a religious origin, you can obtain such control over your body that you can put your body, to all intents and purposes, out of action for a period. You can suspend bodily operations altogether, purely by an act of will. I don't want to say that that claim is necessarily correct, but I do want to say that after all, if that is correct, it affords much the most plausible and easy explanation of these conditions for which Campbell has invoked catalepsy.

Julian S. Huxley: Until I have really seen something of the sort, I would like to suspend judgment. But from the point of view of Joad saying that you could entirely suspend bodily operations, that seems to me to be going a bit far. I don't see how it could suspend the ordinary chemical operations in the blood or the digestive system. You could envisage the mind controlling the body in such a way that it was damped down as it were. But to suspend everything seems to me to smack of something purely miraculous.

SOME BRILLIANT EXPOSITIONS

CIVILISATION

An Air Force Officer asks : "What is civilisation?"

C. E. M. Joad : It is absurd to try and answer a question like that in half a minute. And first one has to clear out of the way quite a number of things that civilisation is not. Civilisation, then, is not to be assessed in terms of material gadgets, of central heating, of efficient plumbing, of convenience, of speed, of wealth, of comfort. You don't get a civilisation when science has enabled people rapidly to alter the position of their bodies in space in motor-cars or in aeroplanes, and they all rush to abuse that ability. Thus the modern world talks of having brought up a generation who will move heaven and earth to save five minutes, and not have the faintest idea what to do with them when they have saved them. Civilisation, it seems to me, somehow depends on what you do with your time, upon the ends that you pursue, and the kind of life that you live ; upon, therefore, the kind of things that you hold to be valuable. If, then, I were to give a quite dogmatic answer to this question, I should say that a civilised society was one in which, first, a large proportion of the community cared for and valued truth for its own sake ; secondly, has good taste, that is to say were sensitive to beauty and valued beauty ; and thirdly, maintained a high level of moral conduct among themselves and in particular respected the civilised virtues of tolerance, compassion, mercy, justice and understanding. Now if you have a society which in its relation to these three values, namely, truth, beauty and goodness, does in respect of a large number of its members honour them, pursue them and in its daily life try to practise them, then I should call that a civilised society, even if it was comparatively poor, and even if it had very few mechanical contrivances at its command.

HAROLD NICOLSON DEFINES "A NATION"

Mr. G. Fordham, of Hertford Heath, asks : "What is a nation ?"

Julian S. If I may butt in and probably provoke
Huxley : Nicolson, I should say that a nation is a collection of people who inhabit a definite area and have a common tradition and a common government, but I should imagine that there are exceptions to every single one of those statements taken *seriatim*.

Harold It is almost impossible to define what is
Nicolson : meant by a "nation." In theory the United States are not a nation and yet in practice they are very much a nation. I often say to Americans, "What makes you feel that you are Americans?" They always reply, "An idea." As with us in this island, although we are very mixed, too, I think it is not so much an idea as a very sharp sense of outline. For some of us it takes the picture of the Dover coast in an insular sense, but with America is isn't at all a physical idea. It is a purely mental concept, and with us I am perfectly certain that while the unity of this country is so far greater than, let us say, that of Germany is, that although we are more mixed than any other country, yet we have a sharper sense of outline (by which I mean historical outline as well as physical, and cultural outline) than occurs in great continents.

JOAD ON "HAPPINESS"

Mr. D. Cappon asks : "What is happiness?"

C. E. M. Joad : Aristotle says that happiness is to be found in the exercise of all your best faculties, tuned up to concert pitch, employed upon what he calls an appropriate subject matter, in doing, that is to say, what they are fitted for ; interspersed with intervals of recreation, in leisure, in artistic enjoyment and in the conversation of one's friends. The point about the definition is, that happiness, as he sees it, is to be found in effort and endeavour. It isn't to be found in simply sitting back and saying, "Now let's enjoy ourselves" ; it isn't, then, to be found in the gospel of a good time. Happiness consists rather in doing something which appears to you to be worth while, in being used up to the last ounce of your energy and capacity in the doing of it, and then looking back and noticing that you have been happy. It is not its pleasures that make life worth having ; it is only life that

makes its pleasures worth having. Happiness, as Julian's brother Aldous has said, is like coke—it is a by-product! Something that is thrown off in the process of doing or pursuing something else. Aristotle's famous metaphor is that it is like the bloom on the cheek of a young man in perfect health; it is not a part of health, but it is something added to it." It is a sign that the organism is functioning appropriately on an appropriate subject matter. I should like to put that by saying that happiness is something which doesn't yield itself to direct pursuit, but comes incidentally. It is not a house which can be built with men's hands; and like the Kingdom of Heaven, it can't be taken by storm. It is like a flower that surprises you; a song that you hear as you pass the hedge, rising suddenly and unexpectedly into the night. I would like to sum up by saying that the best recipe for happiness that I know is not to have leisure enough to wonder whether you are being miserable or not. In other words, happiness is a by-product of activity.

"WHAT IS RADIUM?"

Post-Warden Bailey, of Muswell Hill, asks: "What is radium? What is its value, what are its properties, and how was it discovered?"

E. N. da C. Radium is an element which is unstable
Andrade: and breaks down with the discharge of a certain particle and becomes another element. The last market quotation I heard for it was about £10 a milligram, which means about £10,000 a gramme. You want to multiply that by 28 to get an ounce. Say about a quarter of a million pounds an ounce, if you want it in ounces. Its properties are, as I say, to discharge a so-called Alpha particle and become another element, the radium emanation, which in its turn discharges an Alpha particle and becomes another element; which in its turn discharges a particle and is transformed, and so on, until the stable element lead is finally reached. A very interesting thing is the way in which the original radioactivity was investigated with uranium. It was noticed that certain uranium compounds gave out light after light had fallen on them. That is, they were phosphorescent. It was therefore supposed that radioactivity was connected with phosphorescence, and it was not until

investigations were made on a great many uranium compounds, some of which were not phosphorescent, that the property of radioactivity was found to lie in the uranium element. Then it was found that certain parts associated with the uranium, which could be separated chemically, were more radioactive than others, and the element radium was eventually separated out from the uranium, in very minute quantities. I am afraid that is not very clear but it really is rather a big subject for two minutes.

Commander A. B. Campbell: Among the other properties it seems to have a definite deterrent effect on the wireless; because in ships going into Colombo (we have often noticed it) we couldn't pick up Colombo, say, at 100 miles, whereas we got Australia quite easily, nearly 3,000 miles away. Another property, I understand, especially of the radium in "Adam's Peak," the big mountain in Ceylon, is that it has the curious effect of darkening precious stones, diamonds, sapphires and others. That is why the Colombo stones are not very valuable, because they are a bad colour. If you had radium on your person it would spoil a good diamond or a gem by turning it a bad colour.

E. N. da C. Andrade: Well, it would spoil *you* a lot earlier—the kind of quantity needed to spoil the stones. I didn't know there was much radium in Colombo, but if there were a very large quantity of radioactive stuff, then it would ionise the air and of course you would get a kind of effect which might affect any kind of electrical apparatus. But I shouldn't have thought it was present in sufficiently large quantities. It is an undoubted fact that the radiations from radium will colour precious stones.

HUXLEY ON "FITTEST TO SURVIVE"

Mr. Robert Nichols, of Hove, asks: "What does the word 'the fittest' mean when a biologist uses a phrase—the fittest to survive? Does this use of the word 'fittest' imply fitness for short- or long-term survival?"

Julian S. Huxley: The term "survival of the fittest" (which was, I think, coined by Herbert Spencer) is really a very loose one,

though it has often been used as if it had an unvarying and precise meaning. Mr. Nichols is quite right in drawing attention to its looseness. You can only define "fitness" in Herbert Spencer's sense in a general and relative way. "The fittest" are simply those that are fittest to survive under the particular circumstances in which the species finds itself at the moment.

There is a very interesting point in the second part of his question. He asks: "What about time?" And there you *can* distinguish between short-term advantage and long-term advantage. One of the most obvious examples is that of the reptiles. As the reptiles, with the huge dinosaurs and other types, became the dominant biological group in the Mesozoic period, you would think that they were "the fittest." So they were for that period, but later practically all of them became extinct—wiped out—by the competition of the insignificant-looking mammals of that epoch when the climate changed at the end of it.

Then there is a final point, namely, that the struggle for existence is largely a struggle which does not necessarily promote the fitness or advantage of the species as a whole. A great deal of the struggle (which anyway is only metaphorically a struggle) is between individuals within the species, not of the species against nature or against its enemies, and this may be of advantage only to one set of individuals as against another set, not in the least to the whole of the species. It may even be bad for the species as a whole. An obvious example is cut-throat competition and war in our own species.

DOES HISTORY REPEAT ITSELF?

Mr. H. Stephens, of Merthyr Tydfil, would like to know if it is true that history repeats itself.

Harold

It is true that there are certain recurrent

Nicolson: patterns in history, and that certain civilisations reach maturity and pass through stages which are recognisably similar. But it is also to be noted that history never repeats itself exactly, and that whatever hints you may get from the reading of history as to the probable tendency of events, it would be very unwise to assume from that study that events will develop in exactly the same way. It would, for instance, be very foolish were we to conclude from the fact that the Germans have crossed

the Beresina that their return across that historic river would be carried out under exactly the same conditions as Napoleon's recrossing of that historic river. But it would also be true to say that considering the invasion of Russia, the circumstances which defeated Napoleon are very likely in different forms to recur this time.

Julian S. I would entirely agree with Nicolson

Huxley: that what recurs is merely certain steps of pattern, tending to make similarities, but that there is never a real repetition. You can see that very definitely if you extend your history into prehistory, historic archeology, and real prehistory. It is quite clear that different conditions change sufficiently in human life. Even the pattern does not repeat itself. You get exactly the same thing in biological evolutions of which, of course, history is an extension and you tend to get the same *kinds* of things happening over and over again.

Douglas If it is known that history does not

Woodruff: repeat itself, historians only repeat each other. Historians are often men of science with a passionate desire to introduce order into what looks a peculiarly tangled field. They try and fit to a pattern an extraordinary wealth of accounts and anecdotes which have a great many common features in each age. If you arrange your display so that the common things do stand out, you can put across some unthinking people the impression of your twenty or your fifty civilisations. But it is good always to remember the great dictum of Bishop Stubbs. He said that nine times out of ten people who found these similarities in historical periods were not so much aware of the similarities as ignorant of the differences.

I might illustrate what Woodruffe has
C. E. M. Joad: just said. The great example of the theory of history repeating itself is in the works of the well-known Nazi historian, Oswald Spengler. He wasn't exactly a Nazi but he has been taken over by the Nazis and his book *The Decline of the West* is the Nazi historical bible. And for a very good reason. He says that every civilisation goes through certain well-defined determined phases. He indicates what they are. Now one of the phases, the phase which the Democracies have reached, is, according to Spengler, a phase of extreme democracy in

which the people are spoon-fed and bribed, and is succeeded always by a stage of extreme tyranny, despotism in which all power is centralised in the hands of one man. Now that transition from extreme democracy to tyranny has happened in Germany, and Spengler indicates that it is going to happen all over the world because of this view of his that civilisations always repeat themselves. That presupposes that there is some general law which determines the workings of human nature and human society. It is very much a German view. Hegel says, somewhere, the only thing that men learn from history is that men learn nothing from history, and obviously the point of that is that history goes on always precisely the same as if no lesson could be learnt from the past. If you believe in free-will, as I do, if you believe that man can make his own future, and that it depends upon us what the state of the world is going to be in the years to come, then you don't necessarily think that all the mistakes that have been made in the past are going to be repeated in the future. You don't think, for example, that because at the end of the last war we failed to make a peace settlement which prevented future wars, therefore we shall necessarily make the same mistake when we have the settlement of the world in our hands at the end of this war. In that sense, I don't think that there is any necessary reason why history should repeat itself, though I agree that it very often appears to do so.

Douglas As a foot-note to Professor Joad's *Woodruff*: exposition of Spengler, the ideas were all worked out before the last war. They were too pessimistic to be really very acceptable to the Nazis and Spengler did see his way just before he died to write a very much shorter and considerably more hopeful book which the Nazis encouraged the reading of much more than the large original work.

CHOOSING CAREERS

Mrs. Johnston, of Bradford, says her son doesn't know what profession to take up. Can the Brains Trust suggest what signs to look for if a parent is to try to avoid putting a square peg in a round hole ?

C. E. M. Joad : There is a quite definite answer to that question. There is a body called the Institute of Industrial Psychology. It is

financed partly by the Universities. Its object is to tell parents to what career they can most fruitfully and beneficially devote the talents and the time and the training of their children. The answer to that question is obtained by taking the children (young people, about the age of fifteen or sixteen) and putting them through a large number of psychological tests. The tests are mainly what are called "Intelligence tests" and you can grade people's intelligence, not only according to quality or degree of intelligence, but also according to kind. You can allocate a young boy to one or other categories of intelligence, that is to say category A, category B, category C, category D. Now then, you have a list of occupations and you say: a boy who belongs to category A intelligence will do well in such and such occupation. He will be a good book-keeper, he will be a good clerk. In category B he will be a good manager, a good executive. In category C he ought quite certainly to have his lot cast in the country because he will be miserable in a town. In category D he has a scientific mind and ought to be given a job in which he can have a certain scope for originality. Now all that kind of thing in much greater detail than I have suggested can be told to the enquiring parents by the Institute of Industrial Psychology. I am stressing it because I have always thought that parents would do well to pay very much more attention to the Institute than they do and to avail themselves of its very useful services.

Malcolm I can only answer this question from the
Sargent: point of view of music. I am continually
 having letters from parents saying their
children show musical talent, ought they to go in for music
as a profession? I would say that nowadays almost *all*
children are musically inclined and therefore it doesn't
follow in the least that because they like music, they are
definitely specially talented, as they would have to be to
become successful in music as a profession. For music, my
advice is the same as that of *Punch* with regard to matri-
mony. That is to say—"Advice to those about to marry"
—"Don't!" I would say "Advice to those about to enter
music"—"Don't!" I will go further—to a higher authority
—also speaking of matrimony, who said that "it is better
to marry than to burn." If the passion for music is a
burning one, then go in for it and you are bound to succeed.

Commander In this small island of ours it is impossible to get more than seventy miles from the sea and it is very remarkable the numbers of letters I have had from parents asking me how they can get their boys to sea. I suppose every youngster in England has the salt on his lips, and he feels the desire to go on adventurous journeys. To-day, the sea is a very good profession. The Mercantile Marine is getting better and better every year, the Navy holds out good prospects. If I had a son, I should certainly, if I had the chance, put him to sea.

Julian S. But surely the point is not whether
Huxley: this or that is a good profession but whether the boy is suited for it or not. There I would entirely support Joad as to the excellent work, constantly improving, which is being done by the Institute of Industrial Psychology and similar bodies elsewhere.

CO-EDUCATION

A question from a school-boy. He would like to know what the Brains Trust thinks of Co-education.

Margery Fry: Well, there are the strongest of arguments against standardising all our schools, but I think co-education is excellent for some people and not at all good for others. You do, it seems to me, very much want more mixing of young people at the growing-up age. For most types of people I think it is a disaster that so many of our "supposed-to-be-intelligent" boys are kept right away from female society for so much of their lives at public schools. The real public school mixes them better as a rule. But I do not think it would be at all a wise thing to insist on it for everybody because some people develop better amongst people of their own sex, and others I think develop much better in mixed society.

C. E. M. Joad: May I voice a purely personal prejudice. This is, in a sense, an answer which I am ashamed to make and yet I hold it very strongly. It is that almost all the boys that I have met who have been co-educated seem to me to have suffered in the process. All the girls I have met who have been co-educated seem to me to have benefited from the

process. People can deduce from that whatever they please.

Margery Fry: I think there has hardly been enough "normal co-education" in boarding schools for Professor Joad to be allowed to make such a deduction as that. After all, the co-educational schools have been a little bit "crank schools." I don't wish to use the word at all abusively. We have not had a great number of schools to which boys and girls were ordinarily sent and perhaps that is the reason why he has found the present product a little "crankish."

THE ORIGIN OF LIFE

Mr. R. W. Deacon, of East Acton, would like to know : "What is the origin of life ?"

Julian S. Huxley: Haldane is a bio-chemist and can tell us more about it, but like so many of these questions which are asked, there isn't an answer to it, because we don't know. We can only give a rather vague probability, and the probability which biologists consider most probable is that during the cooling down of this planet, there was a certain stage at which conditions were once favourable in a way they never could be again for the production of very elaborate molecules to arise. Some of these were endowed with life, in the sense that they were capable of self-reproduction. The others, which were not quite so good, so to speak, for their purpose, died out, and they were the ancestors of all living things. There is also the fact that you get intermediate stages, in a sense, between life and not life in the shape of the particles, which are probably not alive, but have some of the properties of life, in that they are self-reproducing in certain circumstances.

J. B. S. Haldane: I would suggest that the origin of life was, if you liked that phrase, to be found in the contradictions of non-living matter. That, in fact, it does not have quite such simple properties as we chemists like to teach children that it has ; and that it is by a development of those little contradictions that we've built up life, just as we become conscious when things don't quite go according to plan, and instead of walking unconsciously we hit our foot on something.

In the same way, life has arisen from contradictions in the normal working of inorganic matter.

Julian S. But how? I don't understand at all
Huxley: what you mean.

J. B. S. Let us say that life is an enormous
Haldane: magnification of very slight exceptions to the rules of chemistry and physics.

At some time it originated, or, if you like, came to the surface. These exceptions were there all the time, but on much too small a scale to be measured or to have any effect worth mentioning to the properties of matter. But under certain circumstances they can be magnified into life, just as the traces of consciousness which we have when walking along the pavement can be magnified into consciousness when we tread on something that shouldn't be there.

Julian S. But you would agree that that happened
Huxley: at one particular time in the evolution of the earth?

J. B. S. Yes. Yes, I would agree with your
Haldane: statement, historically.

Donald I'm sure that many listeners will be
McCullough: grateful to Dr. Julian Huxley for butting in, and asking for this thing to be explained again rather more gently.

C. E. M. Joad: I would just very much like to register my disagreement both with Huxley and with Haldane. I don't think that the question has any meaning, because it presupposes that life had an origin, and I take both their answers, or the implications of both their answers, to be that there was a time when there was no life. Life therefore arose in a world which once knew it not, arose from non-living matter.

Julian S.
Huxley: It must have.

C. E. M. Joad: I don't believe that. I believe that there has always been life, whether or not you adopt the theological explanation, and hold that life derives from God, who, as the Bible says, breathed the breath of life into clay, which seems to me a perfectly tenable and plausible explanation. I don't know why it should not be mentioned. Whether you adopt

that or not, I think it is still possible to say that life from the first is eternal, and that there may very well have been a moment when it entered into the constitution of this planet in the sense that it found that it was possible to animate and use matter, which had reached the condition suitable for the reception of life. The thing impales on the question, "Can you make life artificially?" Supposing you could. I should say that all you had done was artificially to bring matter to a condition in which it could take the current of life, and you have no more made life than the architect who made a house could be said to have created the people who came to occupy it. I am pleading, you see, for the independence of matter from life.

Julian S. That of course is fundamentally opposed

Huxley: to general ideas of modern biology, which would say that life is something that

you can detach from matter but is the properties of a certain sort of matter, just as electrical properties are the properties of a machine made in a certain way, and in that sense. It is very nice that Joad has these comforting beliefs. In the sense in which life is used by biologists it must have originated at a definite time.

C. E. M. Joad: I must just have a word on that. Huxley says in the sense in which life is used by biologists, but there are many other senses in which it is used, and life was used and was known long before biologists were ever thought of or named it, and it seems to me that it is a gross assumption to suppose the scientific method and the biological method of treating of and explaining life is the only method. You can approach it from the side of theology, from the side of morals, or from the side of philosophy, and in each of those angles you get an entirely different treatment and I should have thought a different answer.

Julian S. Quite. But what we hope is that the

Huxley: scientific treatment is giving a better answer.

HOW HALDANE WOULD REDESIGN YOU

Mr. R. Hankinson, of New Ferry, Cheshire, asks the Brains Trust: "Would you have designed human beings as we know them, or could you have improved upon the design?"

I think I could personally have improved
C. E. M. Joad: on the design. Let us think of some obvious things. The difficulty of bringing us into the world, and the fact that when we leave the world and are dead we are nauseating to the nose. The fact that our stomachs are extremely vulnerable and totally unprotected according to the way in which we have evolved. So much for our body. A word about our minds. It seems to me that our morals don't improve, and if I had made human beings I would have made them capable of improvement.

J. B. S. Haldane: I would not have designed human beings as they are. To take a simple example, I should have put the windpipe behind the gullet instead of in front of it, so that if I laughed, as you, sir, are trying to make me do at the moment, I should not have been in any danger of dropping my food into my lungs. But I am fairly certain from what I know of animals that if I had altered the design I should have altered it for the worse. Because we find, as a matter of fact, that small changes in the design of an animal produce quite unexpected results. For example, if you make a fly yellow, which ought to be black, you will find that its skin becomes so permeable with water that it dries up very easily. I give that as an example of the entirely unexpected effect. Probably if the windpipe could be put behind the gullet something much worse would go wrong. Therefore, you can congratulate yourselves that I am not your designer.

Julian S. Huxley: I very much agree with Haldane, and am extremely glad that none of us is called on to design a new human being, because I am quite sure that we should fail much worse than Frankenstein did when he had the power. To take as an example what Joad said about morals, I feel sure it would be a most terrible world if we tried to design people who were always going to act morally. We should ultimately find that they were most intolerant and that the improvement was not kept up for any length of time. We should fossilise into an appalling régime of Puritanism and so forth, if we had not taken into account all the difficulties, as we certainly should not, of such a design.

THE BRAINS TRUST ON THE ENGLISH LANGUAGE

A member of the Canadian Forces asks: "What is the origin of the English language?"

Julian S. If I may butt in as a mere biologist (but
Huxley: MacCarthy will correct me) surely it has a double origin. It is Anglo-Saxon, plus a great deal of Latin words introduced chiefly through Norman French. Then, of course, it has added to itself through its history in a way which probably no other language has. I would be willing to take a bet that, round this table, people could not tell me of a common word we use every day derived from the Aztec, and another derived from the Hindoo.

Donald Ah, Campbell! He was there when
McCullough: it was derived!

Commander

A. B. Campbell: Khaki is a Hindoo one.

Julian S.

Huxley: And chocolate is Aztec.

Desmond Beside the Anglo-Saxon element in
MacCarthy: English which is so important, and some people think is the real backbone of the language, there is the Latin which didn't come merely through Norman French, but came directly through from the Latin itself. One must remember that the educated people of Europe had Latin in common as their language. It is a great thing for us that we have those two "stops," so to speak, to pull out. We have the grandiose and sonorous Latin words, and we have sharp, earthy, concrete words from the Anglo-Saxons. That is what makes our language so rich.

C. E. M. Joad: I should have thought that Greek was almost as important as Latin, and whenever Huxley said Latin and MacCarthy said Latin, I should have liked to have added Greek. In fact practically all scientific words come from Greek.

F. G. Thomas: The thing that has always interested me is, if you look at the words we have taken from other languages, they reflect very closely the sort of influence the people speaking those

languages had on our life, the things we borrowed permanently from them. For example, to take only one case—a number of our Roman words concern measurement, trade and so on—"f.s.d." and "mile" and "inch" and "government." Those examples can be multiplied many times, as for example, the words we borrowed from the Norman and so on. It throws an interesting sidelight on the origins of our language.

Julian S. Huxley: Yes, there is the famous case of the Norman, versus the Anglo-Saxon, where you have the only language in the world which has different words for the meat derived from an animal and for the animal itself. I was brought up on the idea that the Norman lords ate the things, and the Anglo-Saxon peasants had to prepare them. You have beef and ox, and you have pork and pig, and so forth—mutton and sheep. I don't think that exists in any other language.

C. E. M. Joad: I would like to follow up Thomas's extraordinarily interesting point. It is a very good cue for all sorts of thoughts. What did we get from Rome—law and government and fighting? Almost all our words about law, government and fighting are Latin. What have we got from Greece? Science, art, philosophy, and almost all those words which have to do with the life of the mind, or the life of the spirit, come from Greece. Interesting point.

Desmond MacCarthy: But I don't think it is by any means words connected with law and government which are chiefly Latin. For example, take the word "immortality" or "mortal"—that comes straight from the Latin. It is quite true that many of those words have also a synonym in Anglo-Saxon, and the art of writing is very largely to choose whether you're going to use the Latin or the Saxon word. Of course, people like William Morris thought that the Saxon was always the best; his disciples pushed it to such an extent that they proposed to call a perambulator a "push-wain." But I don't think that was a happy suggestion. Again, think of Wordsworth's magnificent title for his poem "Intimations of Immortality"—that is grand. If you translate that into Saxon you say "Hints of Deathlessness," which is a hissing and tiresome phrase. We can be thankful from the bottom of our hearts that we have two elements in our language.

BASIC ENGLISH

Mr. Shackler, of Newbury, asks: "What is the origin of Basic English, and would its introduction improve our writing, reading and expression?"

Julian S. It was originated by Ogden of Cambridge,
Huxley: at a place which he called the Orthological Institute, if I remember. Its principle is that you should have as few words as possible to get on with the business of communicating your ideas. I think there are only 800 words altogether in Basic English. But it is not primarily designed to improve our expression. Its primary purpose, as I understand it, is to facilitate the spread of English as an auxiliary word language, which I would say it undoubtedly would help to do.

Commander I think that some of the words in our
A. B. Campbell: language are very beautiful, and the little shades of light and colour you can express in your words give so much better expression to your thoughts by using more than 800 words.

Julian S. That was just my point. I am not saying
Huxley: that we should do anything to impair the beauty of our language. I am simply saying that for purely practical purposes, our language is a beautiful language, but it is also, both in its spelling and otherwise, a very elaborate language, and if you want a purely international, auxiliary language just for making yourself understood, you want to simplify it.

I happen to know Ogden, and he is a
C. E. M. Joad: great internationalist, which enables me, I think, to dot the i's and cross the t's of what Huxley was saying. Ogden's great hope is that Basic English could become the international language. Of course, there are rivals in the field. There is Esperanto, there is Ido, but they have never, I think, cut very much ice. It seems to me that if, after the war, as one hopes, England and America and the Dominions have a large voice in the making of peace, if after the war we can look forward to some kind of International Institution in the world, the most important is that there should be an international language. Now there Basic English starts with an enormous advantage. It is already the language

of vast numbers of people in the world, and because there are only 800 words it would be extraordinarily easy for those people who are not Anglo-Saxon talkers to learn it. It is a great hope. One of the great hopes of International peace and order after the war.

NORTHANTS SPEAKS BEST ENGLISH

Another question from two very young school-girls at Ilfracombe, Molly and Janet Brookham. They ask a question which they say their school-mistress can't answer ; the question is : "In what part of England is English best spoken ?"

Commander I've always heard that in Inverness you
A. B. Campbell : hear the purest English.

E. N. da C. There can only be one answer from a
Andrade : Londoner of course (we are most of us Londoners), and that is London. I am quite confident about it and absolutely incapable of supporting it.

C. E. M. Joad : I would like to generalise Andrade's answer, and say that the part of England in which English is best spoken always appears to oneself to be that part of England in which one oneself is.

Tom Clarke : This is a question that arises almost every week in a newspaper office when you are asked in letters from readers : "Where are the best-looking girls?" and this question, "Where is the best English spoken?" I always thought it was the B.B.C. and it is rather surprising to me that none of you Brains Trust here haven't admitted it! Let me give you then the result of a test that we did once make in a certain newspaper I was connected with in order to find the answer to this question. The majority reply was : The best English is spoken in Northamptonshire.

DESMOND MacCARTHY ON SWEARING

Arthur Higgins, of Preston, wants to know why certain words are called "swear words" or "bad words" and by what authority they are so classified.

Desmond The oath was invented by mankind to
MacCarthy: relieve its passionate feelings, and it
 swore by whatever was sacred to it.
 The reason why those words became disreputable was that
 this meant taking serious ideas in vain. To avoid doing
 that you got expressions like "By gad" instead of "By
 God," and so on. The other thing besides religion which
 mankind is preoccupied with is sex, and therefore when
 men were in an agitated frame of mind, they used words
 connected with sex. Of course many of our swear words
 are corruptions, like "bloody" of "By our Lady" and so on.
 Oaths have been defined as "fossilised piety"; fossils
 are handy to shy at people's heads.

ROUND THE BRAINS TRUST

DIP INTO THE PAST

Miss Scott, of Herne Hill, asks the Brains Trust whether they would rather have lived in any other period than the present, and if so, their reasons for their choice.

Commander I honestly think I would go back to the
A. B. Campbell: old Elizabethan days, and be one of those
 old discoverers who went West and
 sailed round the world. Adventure has always appealed
 to me from boyhood days, and I still have the love of it
 in me. I am very happy in the present age, I must admit,
 but if I had to take another one I'd sooner take the
 Elizabethan.

I would prefer to be living as we are now.

Edward Hulton: It sounds rather stupid to say that we
 are living in our finest hour, to quote
 what a great man has said, but I think we are. There is
 beauty now, because we are fighting for a great cause.
 We don't see many outward manifestations of beauty,
 but I hope we shall build those up after the war. The
 Commander talks about the Elizabethan days, but he has
 probably taken part in just similar things in his own life,
 only we all of us have rather a habit of thinking that the
 past was more glamorous.

Julian S. I think there is a great deal to be said for
 Huxley: living now, from the point of view of
 excitement and interests. I wouldn't
 say from the point of view of really enjoying it. That is a

little different. But actually, if one was to choose, I think I would prefer to have been born a little earlier than I was, when things were a little easier. I did have a few years before the last war, and they certainly were a great deal more agreeable than post-war and second war periods.

E. N. da C. I think that I would have liked to have
Andrade: lived in the second half of the seventeenth century, round about 1660 to 1680. It was probably the period of the most exciting intellectual developments, when Newton and people only just second to Newton were putting forward their ideas. England was undoubtedly a wonderful place then. The Germans hadn't been heard of. And altogether, as regards literature, furniture, housing, and intellectual life, it was really a marvellous period of English history. We had on the throne a King who, with all his faults, was really a supporter of science and learning, and we have only had once since.

C. E. M. Joad: I am afraid I must begin by making a distinction as usual, and that is this. Here we all are, middle-class people, and I understand from what I just heard that Hulton is a millionaire. Well now, if one is to say supposing you had been a member of the middle classes, when would you have lived? My answer is, quite certainly in the eighteenth century. But I am bound to recognise that nine-tenths of all the human beings who ever existed have had a meagre, wretched existence. They have not known where their next meal was coming from, and they have known that when it came it would not be a square meal. They have wrung a meagre living from the earth by the sweat of their brow, and I am quite convinced that the modern world for most people is a very much better place than it has ever been, because most people have a very much better and squarer deal in life than they have ever had on the purely economic plane. Therefore, it seems to me that the answer to the question does depend very much upon who you suppose yourself to be. If I am to suppose myself not to have been a member of the great mass of mankind, the dispossessed multitudes, the slaves, the serfs, the labourers; if I am to suppose myself to have been a member of the middle classes, or a gentleman, then I think I answer, either fifth-century Athens, or eighteenth-century England. Eighteenth-century England when, someone has said, there

was still beauty, when a man could wander abroad in the country where he pleased, where people had a creed and a code, where life seemed worth while, when existence had a point and a purpose, when men had something in which to believe. None of those things seem to me true about most of us to-day. There is a sort of anarchy and a lack of creed, a lack of code about our lives. We are ruthless. Therefore, with all those reasons, I think I would say the eighteenth century.

CLASSICAL BOOK-SHELF

The next question comes from Mr. D. E. Griffith, Compton Bassett, in Wiltshire. He wants the Brains Trust to recommend eight half-crown classics for a soldier to take on active service.

C. E. M. Joad: I should have said that the most important thing was to take a book of understandable pleasant philosophy. For that purpose I recommend *Selections from Plato* in "World's Classics," Oxford University Press, price 2/6, introduction by Sir Richard Livingstone, published three months ago.

Commander A. B. Campbell: I am glad I come in second. I fancy everybody will want to say this. I certainly think that Shakespeare's works should be one book to take with him.

Malcolm: If I could take only one book, I would take the Bible.

Julian S. Huxley: I think it is good to have some good, long novel to get your teeth into and I should have thought that (especially for a soldier) Tolstoi's *War and Peace* was unrivalled. You should also take a book of poetry and it should be a selection. If the *Oxford Book of English Verse* is in a cheap edition, that would be ideal. If not, *The Golden Treasury*.

As to novels, I quite agree to *War and Peace*, Huxley's selection, but I would like to add a couple of Trollope's: *Barchester Towers* and the *Last Chronicle of Barset*(?). They are both in the way of being classics and both are absolutely first-rate. History? I would like to suggest Gibbon, *The Decline and Fall of the Roman Empire*, which I think is the greatest history book ever written. One others suggests-

tion I would like to make and it is this. I think Swift's *Gulliver's Travels* is one of the greatest books ever written. It happens to be in *Everyman*, price 2/6, and it is extraordinarily topical. The last satire about the Divine forces and the human being who Swift called "Yahoo" is extraordinarily apt to the moment. I won't say to what nation it happens to be apt. Let the soldiers read it and find out.

Commander It may sound dry reading, but one of
A. B. Campbell: the most interesting books I've read has been Motley's *History of the Dutch Republic*."

RECOMMENDED BY THE BRAINS TRUST

Miss Joan Dawe, of Bristol, writes: "A young student, after four or five years of reading for exams, is taking six weeks' holiday, and would like the Brains Trust's help in selecting light literature. Can they suggest half a dozen of the best books published in the last ten or twelve years?"

E. N. da C. She ought undoubtedly to read Robert
Andrade: Louis Stevenson's *Wrong Box*. It was not published in the last ten or twelve years, but if she really wants an amusing time, it is a book which is far too little known, and she will be very thankful to me if she reads Robert Louis Stevenson's *Wrong Box*, if she has not read it already.

Julian S. For light literature (I am again going
Huxley: back beyond the ten years) I am a great admirer of Anstey. Anstey's *Vice Versa* never palls, if you don't know it already.

The question is so illimitable. There is
C. E. M. Joad: so much you could read. Let me stake out a claim on one particular line of country. I would, I think, select books dealing with the country. That means Hardy; all or any of Hardy's novels. W. D. Hudson, whose centenary was celebrated only a fortnight ago, who I think is the greatest writer on the English country, although he came from the Argentine. Then there are a whole number of people now writing first-rate novels about the country. H. E. Bates, Adrian Bell—his best-known book is *Corduroy*. The one I give full marks to is by a man called H. W. Freeman. Let

Miss Dawe read *Joseph and his Brethren*, the best novel on English country life, in which the land is the hero, and she would have an absolute respite from her subject, whatever it is. Unless it is agriculture.

Quentin I think Miss Dawe would be much

Reynolds: happier if she brought the book along called *The Crock of Gold*, if she hasn't read it. Let me quote one paragraph from it, Miss Dawe. It is so typical. There are two philosophers in the book, and they both marry, and in time one had a daughter and the other had a son. The boy who had the son said he was very happy, because there were too many women in the world already. And the philosopher who had the daughter, he was very happy too, because he said: "You can't have too much of a good thing." *The Crock of Gold* is like that.

Julian S. I agree with Reynolds, but he has forgotten to mention the author, who is James Stevens, isn't it?

Quentin

Reynolds: Yes.

Commander I read a delightful book quite recently—

A. B. Campbell: *I Bought a Mountain*, but for the life of me I can't remember the author.

C. E. M. Joad: Thomas Firbank.

Quentin

Reynolds: And of course Miss Dawe must bring along, I think, the greatest novel of our generation, Hemingway's new book.

Julian S. It is a bit gloomy; I don't know if she wants something to cheer her up.

Huxley:

E. N. da C. If she wants something really to cheer her up, and something American, I should advise her to read *Archy and*

Mehitabel, because it is the only book written by a Cockroach. The translator is Don Marquis.

Donald And in view of the Anglo-American background of the Brains Trust to-day, I think we might slip in *White Cliffs*.

McCullough:

Julian S. Yes, and another American book which is inimitable is Clarence Day's *Life with Father*. Wonderful book!

Huxley:

Donald I think that is probably about as much
McCullough: as Miss Dawe can cope with. After all,
she has only got six weeks' holiday.

QUESTIONS *THEY* CAN'T ANSWER

Miss Garrett, of Golders Green, would like to ask the members of the Brains Trust what are their own particular problems: Have they any questions that they can't answer?

C. E. M. Joad: Gracious me, yes!

Donald Everyone is looking very tense, Miss
McCullough: Garrett. I think you can take it the answer is, they have.

E. N. da C.

Andrade: Everyone is thinking about income-tax.

C. E. M. Joad: Of course you can take the question trivially or seriously. Trivially, with all respect to Andrade, includes questions of income-tax; it also includes, for me, such questions as why when I am walking along a pavement I always walk so that my toes exactly touch the cracks between the flag-stones, and why am I afraid of heights. But I don't want to do Miss Garrett the injustice of answering what I think is a very important question in that trivial way. Let me then try to say what really worries me. I am one whose profession it is to teach philosophy. Continuously, therefore, one is posing to one's self (and it is implicit in all the things one has to teach) such questions as (one almost blushes to mention them) why is there a Universe at all? Then, putting it egoistically, why is there a *me* at all, what am I existing for? What is the purpose of my existence? And since I do exist, why should I try to live in a certain kind of way? Bringing this to a point, why should I ever do something other than what I want to do? Why should there be for me the conflict between inclination and duty which is called the problem of temptation? Why in fact ever deny myself anything, as I sometimes feel I ought to deny myself? It so happens that these things bother me a great deal at the moment, because I have always been an agnostic. I have always thought that there was *no* answer to these questions, and that though they were interesting enough, it was useless

to try to answer them. Now I think I am coming (partly under the influence of the war) to think that the traditional religious answers may be the correct ones. They don't help you to understand very much, but they do mean that the total blank incomprehension that was experienced before is slightly diminished. Though how if a good God made the world, there is pain in it, and evil, I have never been able to understand. But, I would like to add this. It seems to me that knowledge is like a little lighted sphere set in a great environing mass of darkness. The more you enlarge the area of the sphere, the more you enlarge its area of contact with the darkness. In other words, the more you know, the more you realise what you don't know. That I think is true on the intellectual plane. I am not sure if it is necessarily true on the religious plane.

Donald Well, after that prodigious exposition of
McCullough: the troubles that rest on the shoulders of Professor Joad, it is rather difficult for ordinary people to come forward, but I think we might just rush round the table. Professor Andrade, what is worrying you at the moment?

E. N. da C. What is worrying me at the moment is
Andrade: not the point. It is what is supposed to worry me in the dead of night, I take it, "in the dull unhappy night when the rain is on the roof"; problems of good and evil and all that kind of thing. Why do Good and Evil exist? And "whether angels in flying from place to place pass through the intermediate space; whether God Himself is the Author of the evil or if it is all the work of the Devil?"—and all the other mediæval themes. In a smaller way I am very anxious to know how metals behave when they are pushed and pulled, on which I have been spending many a year.

Donald Professor Andrade's worried about
McCullough: metals . . .

E. N. da C. Honestly, I think Professor Joad has
Andrade: practically given a universal description of the trials and troubles of the human race. I feel very much he has expressed exactly what I feel with regard to the "Whither?" and the "Whence?" and what we are doing here, and what is Evil and what is Good. I am not a philosopher and so I can't supply any

answer, but I really feel that they are the great problems that do worry *me* in the dark nights.

Tom Clarke : Joad has given me a pointer which I shall have to think about—and that is this : It seems to me that the philosophy of life for most of us is a sort of mental accommodation to our weaknesses and prejudices, and I have got a great many of both. And that is worrying me, how to adjust them to a life of, shall I say, usefulness and social justice.

Desmond I can't help thinking that Miss Garrett
McCarthy : was poking fun at us! I am only a guest on the Brains Trust, but they must have made a great impression on her—or, she is poking fun at them, because the suggestion of the question really was, are there *any* questions which they, such wonderful people, are bothered in finding the correct answer to? Well, of course, the fact is that the people who are by way of *thinking* find questions more difficult to answer than the people who don't think at all. So I suppose the answer ought to be that there are a great many *more* questions to which the Brains Trust cannot find a reply than the ordinary person supposes.

THAT'S ALL

Question-Master It is now my duty as Chairman to say
McCullough: "Time, Gentlemen, please." But before I do, I'd like to say a word to the people who send in the questions that don't get answered. One hundred thousand have sent in questions and, although the Brains Trust has talked for 35 hours, we've only dealt with 500. That leaves over 99,000 people who paid postage to send in questions and heard nothing more. The number includes a man who has sent in the question "What is progress?" fourteen times. As if we'd know.

Well, the first thing I'd like to say to the gallant 99,000 is that we're very sorry; but don't give up hope. Lots of people send in variations of the same question, and every time one of these questions comes along we polish off a large number of enquiries. The only point is that we like to have one expert present when we tackle any specialised problem.

This brings me to our producers. I think we ought to congratulate them on retaining so much of their sanity. If you'd read 100,000 letters and spent the best part of the year getting flights of intellectual prima donnas draped round microphones to answer questions—spontaneously and brightly—I think you'd tend to feel very moody if people kept on asking, "What does the producer do?"

I'd particularly like to thank the seven people who wrote in and said they thought we were all very clever and interesting, and also the 15,000 people who have written in to say that we were not. I'd also like to thank the people who said that it was an insult to ask chaps like us why a cow takes off stern first, while a horse keeps its base on the ground till the last moment. As you know, the Brains Trust hadn't the faintest idea. Joad hadn't even the heart to say that it depends what you mean by a cow. Huxley felt it was surely biologically illogical. Campbell said there were no cows in the Arctic. If there had been, he could easily have explained why they got their seats off the ice as quickly as possible. But the interesting point is that 450 people wrote in and told us the answer. In fact, several sent

in a cigarette card which gives the whole story—beautifully illustrated—with a brown horse and a heliotrope cow.

I realise that no one believes our answers are spontaneous and unprepared, so I won't keep on about it. No one believes that Campbell has actually been up the South Pole as well as the North. No one believes that Joad and Huxley are like brothers outside the studio—and I don't mean Cain and Abel. No one believes that my spontaneous remarks are worth the paper they're written on. But that's only fair. Between ourselves—and this is highly confidential—we don't really believe that you ever listen.



